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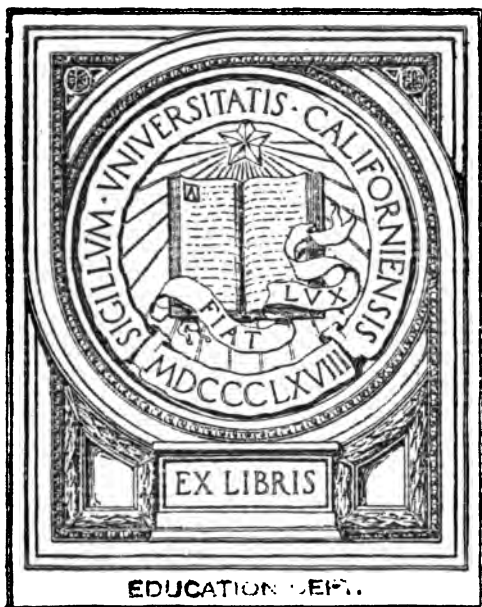
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IN MEMORIAM

John Swett



THE ELEMENTS

OF

GENERAL METHOD

BASED ON THE PRINCIPLES OF
HERBART

BY

CHARLES A. McMURRY, PH.D.

BLOOMINGTON, ILL.:
PUBLIC-SCHOOL PUBLISHING COMPANY.
1892.

THE PANTAGRAPH

LE 1025
M/E

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By C. A. McMURRY, NORMAL, ILL.

EDUCATION FOR

PRESS OF
PANTAGRAPH PRINTING AND STATIONERY CO.,
BLOOMINGTON, ILL.

PREFACE.

THE Herbart school of Pedagogy has created much stir in Germany in the last thirty years. It has developed a large number of vigorous writers on all phases of education and psychology, and numbers a thousand or more positive disciples among the energetic teachers of Germany.

Those American teachers and students who have come in contact with the ideas of this school have been greatly stimulated.

In such a miscellaneous and many-sided thing as practical education it is deeply gratifying to find a clear and definite leading purpose that prevails throughout and a set of mutually related and supporting principles, which in practice contribute to the realization of this purpose.

The following chapters can not be regarded as a full, exact and painfully scientific account of Herbartian ideas, but as a simple explanation of their leading principles in their relations to each other and in their application to our own school problems.

It gives me pleasure to acknowledge the friendly encouragement of Dr. Wilhelm Rein, Professor of Pedagogy at the University of Jena. It is the author's judgment that his lectures, practice-school, and Seminar furnish the



PREFACE.

best opportunity for the study of common-school work both theoretically and practically.

“Die acht Schuljahren,” of Dr. Rein, an extensive work covering the eight grades of the public school, are a rich fund of materials from which I have freely drawn.

In the last chapter extensive extracts from Rein’s “Das erste Schuljahr” and Wiget’s “Die formalen Stufen des Unterrichts” have been incorporated.

Normal, Illinois, July 11, 1892.

CHAPTER I.

THE CHIEF AIM OF EDUCATION.

What is the central purpose of education? If we include under this term all the things commonly assigned to it, its many phases as represented by the great variety of teachers and pupils, the many branches of knowledge and the various and even conflicting methods in bringing up children, it is difficult to find a definition sufficiently broad and definite to compass its meaning. In fact we shall not attempt in the beginning to make a definition. We are in search not so much of a comprehensive definition as of a central truth, a key to the situation, an aim that will simplify and brighten all the work of teachers. Keeping in view the end from the beginning, we need a central organizing principle which shall dictate for teacher and pupil the highway over which they shall travel together.

We will assume at least that education means the whole bringing up of a child from infancy to maturity, not simply his school training. The reason for this assumption is that home, school, companions, environment and natural endowment, working through a series of years, produce a character which is a unit as the resultant of these different influences and growths. Again we are compelled to assume that this aim, whatever it is, is the same for all.

Now what will the average man, picked up at random, say to our question? What is the chief end in the education of your son? A farmer wishes his boy to read,

write and cipher so as to meet successfully the needs of a farmer's life. The merchant in town desires that his boy get a wider reach of knowledge and experience so as to succeed in a livelier sort of business competition. A university professor would lay out a liberal course of training for his son so as to prepare him for intellectual pursuits among scholars and people of culture. This utilitarian view, which points to success in life in the ordinary sense, is the prevailing one. We could probably sum up the wishes of a great majority of the common people by saying, "They desire to give their children through education a better chance in life than they themselves have had." Yet even these people, if pressed to give reasons, would admit that the purely utilitarian view is a low one and that there is something better for every boy and girl than the mere ability to make a successful living.

Turn for a moment to the great systems of education which have held their own for centuries and examine their aims. The Jesuits, the Humanists and the Natural Scientists. They all claimed to be liberal, cultivating and preparatory to great things, yet we only need to quote from the histories of education to show their narrowness and incompleteness. The training of the Jesuits was linguistic and rhetorical, and almost entirely apart from our present notion of human development. The Humanists or Classicists, who for so many centuries constituted the educational élite, belonged to the past with its glories. Though standing in the present they were almost blind to the great problems and opportunities it offered. They stood in bold contrast to the growth of the modern spirit in history, literature and natural science. But in spite of their predominating influence over

education for centuries there has never been the shadow of a chance for making the classics of antiquity the basis of common, popular education. The modern school of Natural Scientists is just as one-sided as the Humanists in supposing that human nature is narrow enough to be compressed within the bonds of natural science studies.

But the systems of education in vogue have always lagged behind the clear views of educational reformers. Two hundred fifty years ago Comenius projected a plan of education for every boy and girl of the common people. His aim was to teach all men all things from the highest truths of religion to the commonest things of daily experience. Being a man of simple and profound religious faith, religion and morality were at the foundation of his system. But even the principles of intellectual training so clearly advocated by Comenius have not yet found a ready hearing among teachers, to say nothing of his great moral-religious purpose. Among later writers Locke, Rousseau and Pestalozzi have set up ideals of education that have had much influence. But Locke's "gentleman" can never be the ideal of all because it is intrinsically aristocratic and education has become with us broadly democratic. After all, Locke's "gentleman" is a noble ideal and should powerfully impress teachers. The perfect human animal that Rousseau dreamed of in the *Émile*, is best illustrated in the noble savage, but we are not in danger of adopting this ideal. In spite of his merits the noblest savage falls short in a hundred ways. Yet it is important in education to perfect the animal development in every child. Pestalozzi touched the hearts of even the weakest and morally frailest children, and tried to make intellectual culture contribute to heart

culture, or rather to combine the two in strong moral characters. He came close upon the highest aim of education and was able to illustrate his doctrine in practice. The educational reformers have gone far ahead of the schoolmasters in setting up a high aim in education.

Let us examine a few well-known definitions of education by great thinkers, and try to discover a central idea.

“The purpose of education is to give to the body and to the soul all the beauty and all the perfection of which they are capable.”—*Plato*.

“Education includes whatever we do for ourselves and whatever is done for us by others for the express purpose of bringing us nearer to the perfection of our nature.”—*John Stuart Mill*.

“Education is the preparation for complete living.”—*Herbert Spencer*.

“Education is the harmonious and equable evolution of the human faculties by a method based upon the nature of the mind for developing all the faculties of the soul, for stirring up and nourishing all the principles of life, while shunning all one-sided culture and taking account of the sentiments upon which the strength and worth of men depend.”—*Stein*.

“Education is the sum of the reflective efforts by which we aid nature in the development of the physical, intellectual and moral faculties of man in view of his perfection, his happiness, and his social destination.”—*Compayre*.

These attempts to bring the task of education into a comprehensive scientific formula are of interest and are yet disappointing. They agree in giving great breadth to education. But in the attempt to be comprehensive,

to omit nothing, they fail to specify that wherein the *true worth* of man consists; they fail to bring out into relief the highest aim as an organizing idea in its complicated work.

We desire therefore to approach nearer to this problem. *What is the highest aim of education?*

We will do so by an inquiry into the aims and tendencies of our public schools. To an outward observer the schools of to-day confine their attention almost exclusively to intellectual training, to the mental discipline and power that come from a varied and vigorous exercise of the faculties. The great majority of good schoolmasters stand squarely upon this platform. But they are none the less deeply conscious that this is not the highest aim of education. We scarcely need to be told that a person may be fully equipped with the best that this style of education can give, and still remain a criminal. A good and wise parent will inevitably seek for a better result in his child than mere intellectual ability and power. All good schoolmasters know that behind school studies and cares is the still greater task of developing manly and womanly character. Perhaps, however, this is too high and sacred a thing to formulate. Perhaps in the attempt to reduce it to a scientific form we should lose its spirit. Admitting that strong moral character is the noblest result of right training, is it not still incidental to the regular school work? Perhaps it lies in the teacher and in his manner of treating subjects and not in the subject-matter itself.

This is exactly the point at which we wish to apply the lever and to lift into prominence the *moral character-building aim* as the central one in education. This aim should be like a loadstone, attracting and subordinating

all other purposes to itself. It should dominate in the choice, arrangement and method of studies. Let us examine more carefully the convictions upon which the moral aim rests. Every wise and benevolent parent knows that the first and last question to ask and answer regarding a child is "What are his moral quality and strength?" Now, who is better able to judge of the true aim than thoughtful and solicitous *parents*? In the second place, it is inconceivable that a conscientious *teacher* should close his eyes to all except the intellectual training of his pupils. It is as natural for him to touch and awaken the moral qualities as it is for birds to sing. Again, the *state* is more concerned to see the growth of just and virtuous citizens than in seeing the prosperity of scholars, inventors and merchants. It is also concerned with the success of the latter, but chiefly when their knowledge, skill and wealth are equaled by their virtues. Our country may have vast resources and great opportunities, but everything in the end depends upon the moral quality of its men and women. Undermine and corrupt this and we all know that there is nothing to hope for. The perpetual enticement and blandishment of worldly success so universal in our time can not move us if we found one theory and practice upon the central doctrine of moral education. Education, therefore, in its popular, untrammelled, moral sense is the greatest concern of society.

In projecting a general plan of popular education we are beholden to the prejudices of no man nor class of men. Not even the traditional prejudices of the great body of teachers should stand in the way of setting up the noblest ideal of education. Educational thinkers are in duty bound to free themselves from utilitarian notions

and narrowness, and to adopt the best platform that children by natural birthright can stand upon. They are called upon to find the best and to apply it to as many as possible. Let it be remembered that each child has a complete growth before him. His own possibilities and not the attainments of his parents and elders are the things to consider.

Shall we seek to avoid responsibility for the moral aim by throwing it upon the family and the church? But the more we probe into educational problems the more we shall find the essential unity of all educational forces. If asked to define the relation of the school to the home we shall quickly see that they are one in spirit and leading purpose, that instead of being separated they should be brought closer together. They are the two sides of the shield.

In conclusion, therefore, shall we make *moral character* the clear and conscious aim of school education, and then subordinate school studies and discipline, mental training and conduct to this aim? It will be a great stimulus to thousands of teachers to discover that this is the real purpose of school work, and that there are abundant means not yet utilized of realizing it. Having once firmly grasped this idea, they will find that there is no other having half its potency. It will put a substantial foundation under educational labors, both theoretical and practical, which will make them the noblest of enterprises.

Is it reasonable to suppose that the rank and file of our teachers will realize the importance of this aim in teaching so long as it has no recognition in our public system of instruction? The moral element is largely present among educators as an *instinct*, but it ought to

be evolved into a *clear purpose* with definite means of accomplishment. It is an open secret in fact, that while our public instruction is ostensibly secular, having nothing to do directly with religion or morals, there is nothing about which good teachers are more thoughtful and anxious than about the means of moral influence. Occasionally some one from the outside attacks our public schools as without morals and godless, but there is no lack of staunch defenders on moral grounds. Theoretically and even practically, to a considerable extent, we are all agreed upon the great value of moral education. But there is a striking inconsistency in our whole position on the school problem. While the supreme value of the moral aim will be generally admitted, it has no open recognition in our school course, either as a principal or as a subordinate aim of instruction. Moral education is not germane to the avowed purposes of the public school. If it gets in at all it is by the back door. It is incidental, not primary.

How to establish the moral aim in the center of the school course, how to subordinate and realize the other educational aims while keeping this chiefly in view, how to make instruction and school discipline contribute unitedly to the formation of vigorous moral character, and how to unite home, school and other life experiences of a child in perfecting the one great aim of education, are some of the problems whose solution will be sought in the following chapters.

It will be especially our purpose to show how *school instruction* can be brought into the direct service of character-building. This is the point upon which most teachers are skeptical. In one whole set of school studies, and that the most important (reading, literature and his-

tory), there is opportunity through all the grades for a vivid and direct cultivation of moral ideas and convictions. The second great series of studies, the natural sciences, come in to support the moral aims, while the personal example and influence of the teacher, and the common experiences and incidents of school life and conduct give abundant occasion to apply and enforce moral ideas.

That the other justifiable aims of education, such as physical training, mental discipline, orderly habits, gentlemanly conduct, practical utility of knowledge, liberal culture, and the free development of individuality will not be weakened by placing the moral aim in the forefront of educational motives, we are convinced. To some extent these questions will be discussed in the following pages.

The importance of making the leading aim of education clear to teachers, is great. If their conviction on this point is not clear they will certainly not concentrate their attention and efforts upon its realization. Again, in a business like education, where there are so many important and necessary results to be reached, it is very easy and common to put forward a subordinate aim, and to lift it into undue prominence, even allowing it to swallow up all the energies of teacher and pupils. Owing to this diversity of opinions among teachers as to the results to be reached, our public schools exhibit a chaos of conflicting theory and practice, and a numberless brood of hobby-riders.

CHAPTER II.

RELATIVE VALUE OF STUDIES.

Having established the leading aim of education, it remains to inquire into the relative value of different studies and their adaptability to accomplish this aim. As measured upon this cardinal purpose what is the intrinsic value of each of the school studies and what the amount of time that should be consumed by each? These questions are not new. Since the time of Comenius, to say the least, they have seriously disturbed educators. But few have had the courage, industry and breadth of mind of a Comenius, to sound the educational waters and to lay out a profitable chart. In spite of Comenius' labors, however, and those of other educational reformers, be they never so energetic, practical progress toward a final answer, as registered in school courses, has been extremely slow.

Herbert Spencer says: "If there needs any further evidence of the rude, undeveloped character of our education, we have it in the fact that the comparative worths of the different kinds of knowledge have been as yet scarcely even discussed, much less discussed in a methodic way with definite results. Not only is it that no standard of relative values has yet been agreed upon, but the existence of any such standard has not been conceived in any clear manner. And not only is it that the existence of such a standard has not been clearly conceived, but the need of it seems to have been scarcely

even felt. Men read books on this topic and attend lectures upon that, decide that their children shall be instructed in these branches and not in those; and all under guidance of mere custom, or liking, or prejudice, without ever considering the enormous importance of determining in some rational way what things are really most worth learning. * * * * * Men dress their children's minds as they do their bodies, in the prevailing fashion."

Spencer certainly does not solve the problem. It can scarcely be said that any Englishman or American has seriously grappled with it. Great changes and reforms indeed have been started, especially within the last fifty years, but they have been undertaken under the pressure of general popular demands and have resulted in compromises between traditional forces and urgent popular needs. A fair philosophical inquiry into the relative merit of studies and their adaptability to nurture mental and moral qualities has not been made.

The Germans have worked to a better purpose. Quite a number of able thinkers among them have given their best years to the study of this problem of relative educational values and to a working out of its results. Herbart, Ziller, Stoy and Rein have been deeply interested in philosophy and psychology as life long teachers of these subjects at the University, but in their practice schools in the same place they also stood daily face to face with the primary difficulties of ordinary teaching. At the outset, and before laying out a course of study, they were compelled to meet and settle the aim of education and the problem of relative values. Having answered these questions to their own satisfaction, they proceeded to work out in detail a common school course.

The Herbart school of teachers has presumed to call its interpretation of educational ideas "scientific pedagogy," a somewhat pretentious name in view of the fact that many leading educators in Germany, England and elsewhere deny the existence of such a science. The exposition of principles that follows is chiefly derived from them.

With us the present time is favorable to a rational inquiry into relative educational values and to a thorough-going application of the results to school courses and methods.

In the first place the old *classical monopoly* is finally and completely broken, at least so far as the common school is concerned. It ruled education for several centuries, but now even its methods of discipline are losing their antique hold. The natural sciences, modern history and literature have assumed an equal place with the old classical studies in college courses. Freed from old traditions and prejudice our common school is now grounded in the vernacular, in the national history and literature, and in home geography and natural science. Its roots go deep into native soil. *Secondly*, the door of the common school has been thrown open to the new studies and they have entered in a troop. History, drawing, natural science, modern literature, and physical culture have been added to the old reading, writing and arithmetic. The common school was never so untrammelled. It is free to absorb into its course the select materials of the best studies. Teachers really enjoy more freedom in selecting and arranging subjects and in introducing new things, than they know how to make use of. There is no one in high authority to check the reform spirit and even local boards are often among the

advocates of change. *In the third place*, by multiplying studies, the common school course has grown more complex and heterogeneous. The old reading, writing, arithmetic and grammar could not be shelved for the sake of the new studies and the same amount of time must be divided now among many branches. It is not to be wondered at if all the studies are treated in a shallow and fragmentary way. Some of the new studies, especially, are not well taught. There is less of unity in higher education now than there was before the classical studies lost their supremacy. Our common school course has become a batch of miscellanies. We are in danger of overloading pupils, as well as of making a superficial hodge-podge of all branches. There is imperative need for sifting the studies according to their value, as well as for bringing them into right connexion and dependence upon one another. *Fourthly*, since we are in the midst of such a breaking-up period, we need to take our bearings. In order to avoid mistakes and excesses there is a call for deep, impartial and many-sided thinking on educational problems. Supposing that we know what the controlling aim of education is, we are next led to inquire about and to determine the relative value of studies as tributary to this aim.

It is not however our purpose to give an original solution to this problem and to those which follow it. We must decline to attempt a philosophical inquiry into fundamental principles and their origin. Ours is the humbler task of explaining and applying principles already worked out by others, that is, to give the results of Herbartian pedagogy as applied to our schools.

Instead of discussing the many branches of study one after another, it will be well to make a broad divi-

sion of them into three classes and observe the marked features and value of each. First, *history*, including the subject matter of reading, history, story and other parts of literature. Second, the *natural sciences*. Third, the *formal studies*, grammar, writing, much of arithmetic and the symbols used in reading.

The first two open up the great fields of real knowledge and experience, the world of man and of external nature, the two great reservoirs of interesting facts. We will first examine these two fields and consider their value as constituent parts of the school course.

History, in our present sense, includes what we usually understand by it, as U. S. history, modern and ancient history, also biography, tradition, fiction as expressing human life in the novel or romance, and historical and literary masterpieces of all sorts so far as they delineate man's experience and character. In a still broader sense history includes language as the expression of men's thoughts and feelings. But this is the formal side of history with which we are not at present concerned. History deals with men's motives and actions as individuals or in society, with their dispositions, habits and institutions, and with the monuments and literature they have left.

The relations of men to each other and to society give rise to *morals*. Whether in the life of David or of Shylock, or of the people whom they represent, the study of men is primarily a study of morals. It is in the hardships, struggles and mutual contact of men that motives and moral impulses are observed and judged. We are chiefly interested to know what qualities of mind and heart, for example, were shown by such men as Bunyan, William the Silent, or John Quincy Adams. Although

history has many uses, its best influence is in illustrating and inculcating moral ideas. It will strike most teachers as a surprise to say that *the chief use of history study is to form moral notions in children.* We have not so regarded nor used history. It has been generally looked upon as a body of useful information that any intelligent person must possess. But there is no doubt that moral and religious dispositions are the best fruitage and test of value in men. Important economic, political and social questions also rest in the end upon moral principles. Some of the best historical materials (from biography, tradition and fiction) should be absorbed by children in each grade as an essential part of the substratum of moral ideas. This implies more than a collection of historical stories in a supplementary reader for intermediate grades. It means that history in the broad sense is to be an important study in every grade and that it shall become a center and reservoir from which reading books and language lessons draw their supplies. These biographies, stories and historical episodes must be the best which our history and classic literature can furnish and whatever is of like virtue in the life of other kindred peoples, of England, Germany, Greece, etc.

If history in this sense can be made a strong auxiliary to moral education in common schools, the whole body of earnest teachers will be gratified. For there is no theme among them of such perennial interest and depth of meaning as *moral culture* in schools. The ever-recurring, emphatic refrain from them is "*the example of the teacher*;" and surely there is no such means of instilling moral ideas as the presence and inspiration of a high-toned teacher. But after all he is only a guide. "He lures to brighter worlds and leads the way." No

teacher can feel that he embodies in himself, except in a very imperfect way, the strong moral ideas that have made the history of good men worth reading. No matter what resources he may have in his own character, the teacher needs to employ forces which lie outside of himself, ideals toward which he struggles and toward which he inspires and leads others. In this sense it is a mistake to center all attention upon the conduct of the teacher. It is better for pupil and teacher to enter into the companionship of common aims and ideals. When these inspirations and aims have gradually changed into tendencies and habits, a child is morally full-fledged. It is, indeed, high ground upon which to land a youth, or aid in landing him, but it is clearly in view.

The common school age is the *formative period*. At six a child is morally immature, at fifteen the die has been stamped. This youthful wilderness must be crossed. We can't turn back. There is no other way of reaching the promised land. But there are rebellions and haltings and disorderly scenes.

Isn't there a quicker and easier way? The most speedily constructed road across this region is a short treatise on morals for teacher and pupils. In this way it is possible to have all the virtues and faults tabulated, and labeled and transferred in brief space to the minds of the children. But no such paved road is worth anything. We have tried it a dozen times in much less important fields of knowledge than morals. It has been demonstrated, for example, in our high schools during a series of years that botany, chemistry, physics and geology cannot be properly taught by such brief scientific compendia of rules and principles. "Words, words, words," as Hamlet said. We cannot learn geography

from definitions and map questions, nor morals from catechisms. And just as in the fields of natural science we are resorting perforce to plants, animals and natural phenomena, so in morals we turn to the deeds and lives of men. We must get at moral ideas without moralizing, and drink in moral convictions without resorting to moral platitudes. Educators are losing faith in words, definitions and classifications. It is getting to be a truism that one can't learn chemistry and zoology from books alone or chiefly.

A little reflection will show that we are only demanding *object lessons* in the field of moral education, extensive, systematic, all-pervading object lessons, choice experiences and episodes from human life, painted in natural colors as shown by our best history and literature. To appreciate the virtues and vices, to sympathize with better impulses, we must travel beyond words and definitions till we come in contact with the personal deeds that first give rise to them. To get the impress of kindness we must see an act of kindness and feel the glow it produces. When Sir Philip Sidney, wounded on the battle field and suffering with thirst, reached out his hand for the cup of water that was brought, his glance fell upon a dying soldier who viewed the cup with great desire, Sidney handed him the water with the words, "Thy necessity is greater than mine." No one can refuse his approval for this act. After telling the story of the man who went down to Jericho, and fell among thieves, and then of the priest, the Levite and the Samaritan who passed that way, Jesus put the question to his critic, "Who was neighbor to him that fell among thieves?" And the answer came even from unwilling lips, "He that showed mercy." Such moral judgments

as these spring up naturally and surely when we understand clearly the circumstances under which an act was performed. On the other hand it is natural to *condemn wrong deeds* when presented clearly and objectively in the action of another. Nero caused Christians to be falsely accused and then to be condemned to the claws of wild beasts in the arena. When cruelty is practiced against the innocent and helpless we condemn the act. But later the judgment must react upon our own conduct. When Columbus was thrown into chains instead of being rewarded, we condemn the Spaniards. In such cases it is possible to observe *how moral judgments originate* and by repetition grow into convictions. In the same way the real world of persons about us, the acts of parents, companions and teachers are powerful in giving a good or bad tone to our sentiments, because, as living object lessons, their impress is directly and constantly upon us.

But a good share of the influences that are thrown around an ordinary child need to be counteracted. It can be done to a considerable extent *by instruction*. Many of the interesting characters of history are better company for us and for children than our neighbors and contemporaries. For the purposes of moral example and inspiration we may select as companions the best persons in history, provided we know how to select for ourselves and others. Their acts are personal, biographical and interesting and appeal at once to children as well as to their elders. The fitting way then to cultivate moral judgments, that is, to form just ideas of right and wrong, of virtues and vices, is by a regular and systematic presentation of persons illustrating noble and ignoble acts. Habits of judgment and of conduct may be thus formed and strong moral convictions established.

If this is the proper origin and culture of moral ideas we desire to know how to utilize it in the common school course. It can only be done by an extensive use of historical and literary materials in all grades with the *conscious purpose* of shaping moral ideas and character. That the school has such influence at its disposal can not be reasonably denied by any one who believes that the family or the church can affect the moral character of their children. It may be objected that the school thus takes up the proper work of the home, when it ought to be occupied with other things. Would that the homes were all good! But even if they were the teacher could not fold his arms over a responsibility removed. As soon as a boy enters school, if not sooner, he begins, in some sense, to outgrow the home. New influences and interests find a lodgment in his affections. Companions, the wider range of his acquaintances, studies and ambitions share now with the home. John Locke objected radically to English Public Schools on this account. But even if we desired, we could not resort to private tutors as Locke did. The child is growing and changing. Who shall organize unity out of this maze of thoughts, interests and influences, casting out the useless and bad, combining and strengthening the good? The more service the home renders the better. The child's range of thought and ambition is expanding, who has the best survey of the field? In many cases at least, the teacher, especially where parents lack the culture and the children need a guide. Who spends six hours a day directing these currents of thought and interest? We are not disposed to underestimate the magnitude of the task here laid upon the teacher. The rights and duties of the home are not put in question. Indeed the spirit of this kind of teach-

ing is best illustrated in a good home. A teacher who has a father's anxiety in the real welfare of children will not forget his duty in watching their moral growth. The moral atmosphere of a good home will remain the ideal for the school. In fact Herbart's plan of education originated not in a school room, but in an excellent home in Switzerland, where he spent three years in the private instruction of three boys. The conscientious zeal with which he devoted himself to the moral and mental growth of these children is a model for teachers. The shaping of three characters was, according to his view, entrusted to him. The common notion of intellectual growth and strength which rules in such cases was at once subordinated to *character development* in the moral sense. Not that the two ideas are at all antagonistic but one is more important than the other. The selection of reading matter, of studies and of employments was adapted to each boy with a view to influencing conduct and moral action.

The Herbart school adheres to this view of education, and has *transferred its spirit and method to the schools*. The Herbartians have the hardihood, in this age of moral skeptics, to believe not only in moral example but also in moral teaching. (By moral skeptics we mean those who believe in morals but not in moral instruction.) They seek first of all historical materials of the richest moral content, in vivid personification, upon which to nourish the moral spirit of children. If properly treated this subject matter will soon win the children by its power over feeling and judgment. With Crusoe the child goes through every hardship and success; with Abraham he lives in tents, seeks pastures for his flocks, and generously marches out to the rescue of his kinsmen. He

should not read Cæsar with a slow and toilsome drag (parsing and construing) that would render a bright boy stupid. If he goes with Cæsar at all, he must build an *agger*, fight battles, construct bridges and approve or condemn Cæsar's acts. But we doubt the moral value of Cæsar's Gallic wars. By reading Plutarch we may see that the Latins and Greeks, before the days of their degeneracy, nourished their rising youth upon the traditions of their ancestry. This education produced a tough and sinewy brood of moral qualities. Their great men were great characters, largely because of the mother-milk of national tradition and family training. In Scotch, English and German history we are familiar with Alfred, Bruce, Siegfried and many other heroes of similar value in the training of youth.

It will be well for us to look into our own history and see what sort of a moral heritage of educative materials it has left us. What notable examples does it furnish of right thought and action? Have we any home-bred food like this for the nourishment of our growing youth? Our native American history is indeed nobler in tone and more abundant. For moral educative purposes in the training of the young the history of America, from the early explorations and settlements along the Atlantic coast, to the present, has scarcely a parallel in history. It was a race of moral heroes that led the first colonies to many of the early settlements. Winthrop, Penn, Williams, Oglethorpe, Raleigh and Columbus were great and simple characters, deeply moral and practical. For culture purposes, where can their equals be found? And where was given a better opportunity for the display of personal virtues than by the leaders of these little danger-encircled communities? The heaven of purity, piety and manly

independence which they brought with them and illustrated has never ceased to work powerfully among our people. Why not bring the children into direct contact with these characters in the intermediate grades, not by short and sketchy stories, but by full life pictures of these men and their surroundings? We have not been wholly lacking in literary artists who have worked up a part of these materials into a more durable and acceptable form for our schools. We need to make an abundant use of this and other history for our boys and girls, not by devoting a year in the upper grades to a barren outline of American annals, but by a proper distribution of these and other similar rich treasures throughout the grades of the common school.

Tradition and fiction are scarcely less valuable than biography and history because of their vivid portrayal of strong and typical characters. Our own literature and the world's literature at large are a store-house well-stocked with moral educative materials, properly suited to children at different ages, if only sorted, selected and arranged. But this requires broad knowledge of our best literature and clear insight into child character at different ages. This problem will not be solved in a day, nor in a life-time.

In making a progressive series of our best historical and literary products, it is necessary to select those materials which are better adapted than anything else to interest, influence and mould the character of children at each time of life. It is now generally agreed by the best teachers that these selections shall be classical masterpieces, not in fragments but as wholes. They should be those classical materials that bear the stamp of genuine nobility. Goethe says "*The best is good enough for chil-*

dren." For some years past in our grammar grades we have been using some of the best selections of Whittier, Longfellow, Bryant, and others, and we are not even frightened by the length of such productions as *Evangeline*, *The Lady of the Lake* or *Julius Cæsar*. A simple, adapted version of *Robinson Crusoe* is used in some schools as a second reader. From time immemorial choice selections of prose and verse have formed the staple of our readers above the third. But generally these selections are scrappy or fragmentary. Few of the great masterpieces have been used because most of them are supposed to be too long. Broken fragments of our choice literary products have been served up, but the best literary works as wholes have never been given to the children in the schools. The Greek youth were better served with the *Iliad* and *Odyssey*, and some of our grandfathers with the tales of the Old Testament. We now go still farther back in the child-life and make use of fairy tales in the first grade. But many are not yet able to realize that select fairy stories are genuinely classical, that they are as well adapted to stimulate the minds of children as *Hamlet* the minds of adults.

The chief aim of our schools all along has not been an appreciation of literary masterpieces either in their moral or art value, but to acquire skill in reading, fluency and naturalness of expression. Our schools have been almost completely absorbed in the purely *formal* use of our literary materials, learning to read in the earlier grades, and learning to read with rhetorical expression and confidence in the later ones. In the present argument our chief concern is not with the formal use of literary materials for practice in reading, but with the moral culture, conviction and habit of life they may fos-

ter. Nor have we chiefly in view the *art* side of our best literary pieces. Appreciation of beauty in poetry and of strength in prose, admirable as they may be, are quite secondary to the main purpose. Coming in direct and vivid contact with manly deeds or with unselfish acts as personified in choice biography, history, fiction and real life will inspire children with thoughts that make life worth living. Neither formal skill in reading nor appreciation of literary art can atone for the lack of *direct moral incentive* which historical studies should give. All three ends should be reached.

Many teachers are now calling for a change in the spirit with which the best biography and literature are used. They call for an improvement in the quality and an increase in the quantity of complete historical episodes and of literary masterpieces. An appreciative reading of *Ivanhoe* revives the spirit of that age. The life of Samuel Adams is an epic that gives the youth a chance to live amid the stirring scenes of Boston in a notable time. Children are to live in thought and interest the lives of many men of other generations, as of Tell, Columbus, Livingstone, Lincoln, Penn, Franklin, Fulton. They are to partake of the experiences of the best typical men in the story of our own and of other countries.

The use of the best historical and literary works as a means of strengthening moral motives and principles with children, whose minds and characters are developing, is a high aim in itself. And it will add *interest and life* to the formal studies, such as reading, spelling, grammar and composition which spring out of this valuable subject-matter.

History, in the broad sense, should be the chief constituent of a child's education. That subject-matter

which contains the essence of moral culture in generative form deserves to constitute the chief mental food of young people. The conviction of the high moral value of historic subjects and of their peculiar adaptability to children at different ages, brings us to a positive judgment as to their relative value among studies. The first question, preliminary to all others in the common school course, "What is the most important study?" is answered by putting *history* at the head of the list.

Natural science takes the second place. In many respects it is co-ordinate with history. The object-world, which is so interesting, so informing, and so intimately interwoven with the needs, labors and progress of men, furnishes the second great constituent of education for all children. Botany, zoology and the other natural sciences, taken as a unit, constitute the field of nature apart from man. They furnish us an understanding of the varied objects and complex phenomena of nature. It is one of the imperative needs of all human minds, that have retained their childlike thoughtfulness and spirit of inquiry, to desire to understand nature, to classify the variety of objects and appearances, to trace the chain of causes and to search out the simple laws of nature's operations. The command early came to men to subdue the earth, and we understand better than primitive man that it is subdued through investigation and study. All the forces and bounties of nature are to be made serviceable to us and it can only be done by understanding her facts and laws. The road to mastery leads through patient observation, experiment and study.

But we are concerned with the *educational* value of the natural sciences. Waitz says: "A correct philosophy of the world and of life is possible to a person only on

the basis of a knowledge of one's self and of one's relation to surrounding nature." Diesterweg says: "No one can afford to neglect a knowledge of nature who desires to get a comprehension of the world and of God according to human possibility, or who desires to find his proper relation to Him and to real things. He who knows nothing of human history is an ignoramus, likewise he who knows nothing of natural science. To know nothing of either is a pure shame. Ignorance of nature is an unpardonable perversion." Kraepelin speaks as follows: "Instruction should open up to a pupil an understanding of the present, and thereby furnish a basis for a frank and many-sided philosophy of life, resting upon reality. But to the present belongs the world outside of us. Of this present there can be no such thing as an understanding unless it relates not only to inter-human relations but also to relations of man to animal, of animal to plant, and of organic life to inorganic life. The necessity of assuming a relation to our environment is unavoidable and this can only be done by acquainting ourselves with the surrounding world in every direction. This requirement would remain in force though man, like a god, were set above nature and her laws. But man lives, acts and dies not outside of, but within the circle of nature's laws. This maxim is axiomatic and contains the final judgment against those who claim that a comprehensive but unified philosophy of life is possible without a knowledge of nature." Herbart says: "Here (in nature) lies the abode of real truth, which does not retreat before tests into an inaccessible past (as does history). This genuinely empirical character distinguishes the natural sciences and makes their loss irretrievable. It is here (in nature) that the object disentangles itself

from all fancies and opinions and constantly stimulates the spirit of observation. Here then is found an obstruction to extravagant thinking such as the sciences themselves could not better devise." Ziller says: "The natural sciences are necessary in education because from the province of nature (as well as from history) are derived those means and resources which are necessary to accomplish the purposes of the will in action. Means and forces are the natural conditions for the realization of aims. Without knowledge of and an intelligent power over nature it is difficult to realize that certain aims are possible; action cannot be successful; will effort based upon the firm conviction of ability, that is, judicious exercise of will, is impossible." We quote also from Professor Rein: "Let us observe in passing that in the great industrial contest between civilized nations, that people will suffer defeat which falls behind in the culture of natural science, and for this reason the motive of self-protection would demand natural science instruction. In favor of this teaching the claim is further made that no science is so well adapted to train the mind to inductive thought processes as that which rests entirely upon induction, and that natural science study is in a position to resist more easily and successfully than all other studies, the deeply-rooted tendency in all branches to substitute words for ideas." Rein (das vierte Schuljahr) explains further the leading ideas and standpoints as they have appeared historically among teachers of science in the common school.

1. Natural history stories for entertainment.
2. *Utility*, or the study of the things in nature that are directly useful or hurtful to man.
3. Description of natural objects, training of sense-perception, etc.

4. Analysis and determination of natural science specimens.

5. System-making, or the reduction of all things in nature to a systematic whole, with a place for everything.

All these are considered as valuable subsidiary aims, leading up to the central purpose of the study of natural sciences which is, "An understanding of life and of the powers and of the unity which express themselves in nature," or as Kraepelin says: "Nature should not appear to man as an inextricable chaos but as a well-ordered mechanism, the parts fitting exactly to each other, controlled by unchanging laws and in perpetual action and production." Humboldt is further quoted: "Nature to the mature mind is unity in variety, unity of the manifold in form and combination, the content or sum total of natural things and natural forces as a living whole. The weightiest result, therefore, of deep physical study is, by beginning with the individual, to grasp all that the discoveries of recent times reveal to us, to separate single things critically and yet not be overcome by the mass of details, mindful of the high destiny of man, to comprehend the mind of nature, which lies concealed under the mantle of phenomena." This sounds visionary and impracticable for children of the common school, especially when we know that much lower aims have not been successfully reached. In fact it cannot be said that the natural sciences have any recognized standing in the common school course. But it is worth the while to inquire whether natural sciences will ever be taught as they should be until the best attainable aims become the dominant principles for guiding teachers. Stripped of its rhetoric the above mentioned aim, "an

understanding of life and the unity in nature" may prove a practical and inspiring guide to the teacher. It may also bring into relation to this higher purpose all the other aims of science teaching. It certainly can not dispense with any of the five historically developed aims above described. They are in the main essential elements of a complete natural science course for children.

But in addition to these the purpose of discovering *the life and unity in nature* has other equally important means of self-realization at its disposal. The *causal relations* in nature are wonderfully stimulating to one who has begun to trace them out. The study of plants and animals in their adaptation to environment, of the relation between organ and function, between organs, mode of life and environment, leads up to a general law which applies to all plants and animals. The law of adaptation is similarly developed. Also the law of growth and development from the simple germ to the mature life form. These laws and others in biology, if developed on concrete specimens, give much insight into the whole realm of nature, more stimulating by far than that based on scientific classifications, as orders, families and species. The great and simple outlines of nature's work begin to appear out of such laws.

Again the study of the whole *life history* of a plant or animal, in its relations to the inorganic world and to other plants and animals, is always a cross-section in the sciences and shows how all the natural sciences are knit together into a causal unity. Take the life history of a *hickory tree*. As it germinates and grows from the seed how it draws from the earth and air; the effect of storms, seasons and lightning upon it, how it later furnishes nuts to the squirrels and boys; its branches may be the

nesting place for birds and its bark for insects. Finally the uses of its tough wood for man are seen. The life of a squirrel or of a honey-bee furnishes also a cross-section through all the sciences from the inorganic world up to man.

In nature as it shows itself in the woods or in the pond, there is such a mingling and interdependence of the natural sciences upon each other that the book of nature seems ~~totally~~ different from books of botany, physics and ~~zoology~~ as made by men. In the forest we find close together trees of many kinds, shrubs, flowering plants, vines, mosses and ferns, grasses, beetles, worms and birds, squirrels, owls and sunshine, rocks, soil and springs, summer and winter, storms, frost and drouth. Plants depend upon the soil and upon each other. The birds and squirrels find their home and food among the trees and plants. The trees seem to grow together as if they needed each other's companionship. All the plants and animals depend upon the soil, air and climate, and the whole wood changes its garb and partly its guests with the seasons. A forest is a *life society*, consisting of mutually dependent parts. How nature disregards our conventional distinctions between the natural sciences! We need no better proof than this that they should not be taught chiefly from books. A child might learn a myriad of things in the woods and gain much insight into nature's ways without making any clear distinction between botany, zoology and geology. Herein is also the proof that text-books are needed as a guide in nature's labyrinth. If the frequency and intimacy of mutual relations are any proof of unity, the natural sciences are a unit and have a right to be called by one name, *nature study*.

It is plain therefore that the lines tending toward unity in nature study are numerous and strong; such as the scientific classifications of our text-books, the working out of general laws whether in biology or physics, the study of life histories in vegetable and animal, and the observation of life societies in the close mutual relations of the different parts or individuals.

If a course of nature studies is begun in the first grade and carried systematically through all the years up to the eighth grade, it is not unreasonable to suppose that real insight into nature, based on observation taken at first hand, may be reached. It will involve a study of living plants and animals, minerals, physical apparatus and devices, chemical experiments, the making of collections, regular excursions for the observation of the neighboring fields, forests and streams, and the working over of these and other concrete experiences from all sources through skillful class teaching.

The first great result to a child of such a series of studies is an intelligent and rational understanding of his home, the world, his natural environment. He will have a seeing eye and an appreciative mind for the thousand things surrounding his daily life where the ignorant toiler sees and understands nothing.

A second advantage which we can only hint at, while incidental, is almost equally important. We have been considering nature chiefly as a realm by itself, apart from man. But the utilities of natural science in individual life and in society are so manifold that we accept many of the finest products of skill and art as if they were natural products—as if gold coins, silk dresses and fine pictures grew on the bushes and only waited to be picked. The thousandfold applications of natural science

to human industry and comfort deserve to be perceived as *the result of labor and inventive skill*. Our much-lauded steam engines, telegraph, microscopes, sewing machines, reapers, iron ships and printing presses, are not examples of a few, but of myriads of things that natural science has secured. But how many children on leaving the common school understand the principle involved in any one of the machines mentioned, subjects of common talk as they are? As children leave the schools at fourteen, or fifteen they should know and appreciate many such things, wherein man, by his wit and ingenious use of nature's forces, has triumphed over difficulties. How are glass and soap made? What has a knowledge of natural science to do with the construction of stoves, furnaces and lamps? How are iron, silver and copper ore mined and reduced? How is sugar obtained from maple trees, cane and beet root? How does a suction pump work and why? Without a knowledge of such applications of natural science we should be thrown back into barbarism. These things also, since they form such an important part of every child's environment, should be understood, but not for direct utility.

Our knowledge of these principles and appliances constitutes in fact a good share of the foundation upon which our whole culture status rests. Without natural science we should understand neither nature nor society.

Historically considered, the study of natural science is the study of man's long-continued struggle with nature and of his gradual triumph. It ends in insight into nature and into those contrivances of men by which her laws and forces are utilized. The whole subject of nature, her laws and powers, must not remain a sealed book to the masses of the people. Scientists, inventors and

scholars may lead the way but they are only pioneers. The thousands of the children of the people are treading at their heels and must be initiated into the mysteries.

But the question that confronts us at every turn is, *What is the disciplinary value of nature study?* We know, say the opponents, what a vigorous training in ancient languages and mathematics can do for a student. What results in this direction can the natural sciences tabulate? The champions of natural science point with pride to the great men who have been trained and developed in such studies. For inductive thinking the natural sciences offer the best materials. To cultivate self-reliance there is nothing like turning a student loose in nature under a skilled instructor. The spirit of investigation and of accurate thinking is claimed as a peculiar product of nature study. It is called, *par excellence*, "the scientific spirit." The undue reverence for authority produced by literary studies is not a weakness of natural science pursuits. But intense interest and devotion are combined with scientific accuracy and fidelity to nature and her laws.

We do not feel called upon to attempt a settlement of this dispute. We have already assumed that *history* in the broad sense (including languages) and natural science (or nature study) are the two great staples of the common school course, and that so far as discipline is concerned one is as important as the other. But we believe that those educators whose first, middle and last question in education is, "What is the *disciplinary* value of a study?" have mistaken the primary problem of education. Just as in the proper training of the body, the strength and skill of a professional athlete are, in no sense, the true aim, but physical soundness, health and vigor; so

in mind culture, not extraordinary skill in mental gymnastics of the severest sort, is the essential aim, but mental soundness, integrity and motive. The underlying question in education is not, How strong or incisive is his mind? (This depends largely upon heredity and native endowment) but, What is its quality and its temper? If might is right, then mental strength is to be gained at all hazards. But if right is higher than might, then mental skill and power are only secondary aims. So long as we are dealing with fundamental aims in such a serious business as education, why stop short of that ideal which is manifestly the best? We have no controversy with the highest mental discipline and strength that are consistent with all-round mental soundness. Our better teachers are not lacking in appreciation for the value of what is called *formal mental discipline*, but they do generally lack faith in the innate power of the best studies to arouse interest and mental life. They emphasize the *drill* more than the *content* and the inspiration of the author. Both in theory and in practice they are greatly lacking in the intellectual sympathy and moral power which result from bringing the minds of students into direct contact with the noblest products of God's work in history and in the object world. Here we can put our finger on the radical weakness of our school work.

The really soul-inspiring teachers have not been formalists nor drill masters alone. Friedrich August Wolf, for example, the great German philologist, was probably the most inspiring teacher of classical languages that Germany has had. But to what was his remarkable influence as a teacher of young men due? We usually think of a philologist as one who digs among

the roots of dead languages, who worships the forms of speech and the laws of grammar. Doubtless he and his pupils were much taken up with these things, but they were not the primary source of his and their interest. Wolf defined philology as "the knowledge of human nature as exhibited in antiquity." He studied with great avidity everything that could throw light upon the lives, character and language of the ancients. Their biographies, histories, geography, climate, dress, implements, their sculpture, monuments, buildings, tombs. Approaching the literature and language of the Greeks with this abundant knowledge of their real surroundings and conditions of life, he saw the deeper, fuller significance of every classical author and the great literary masterpieces we perceived as the expression of the national life. He appreciated language as the wonderful medium through which the more wonderful life of the versatile Greek expressed itself. The reason he was such a great philologist was because he was so great a realist, a man who was intensely interested in the Greek people, their history and life. Words alone had little charm for him. No great teacher has been simply a word-monger.

For the present we leave the question of discipline unanswered, though we are disposed to think that those studies which introduce children to the two great fields of real knowledge and which arouse a strong desire to solve the problems found there will also furnish the most valuable discipline.

Not only the specialists in natural science, whose interest and enthusiasm are largely absorbed in these studies, but many other energetic teachers are persuaded that the culture value of nature studies is on a par with that of historical studies. But on account of the present

lack of system and of clear purpose in natural science teachers the first great problem in this field of common school effort is to select the material and perfect the method of studying nature with children.

Our estimate of the value of natural science for culture and for discipline is confirmed by the opinion of educational reformers and by the changes and progress in schools. An inquiry into the history of education in Europe and in America since the Reformation will show that the movement toward nature study has been accumulating momentum for more than three hundred years. In spite of the failure of such men as Comenius, Ratich, Basedow and Rousseau to secure the introduction of these studies in a liberal degree, in spite of the enormous influence of custom and prejudice in favor of Latin and other traditional studies, the natural sciences have made recently such surprising advances and have so penetrated and transformed our modern life that we are simply compelled, even in the common school, to take heed of these great, living educational forces already at work.

The universities of England and of the United States have been largely transformed within the last forty years by the introduction, on a grand scale, of modern studies, particularly of the natural sciences. The fitting schools, academies and high schools have had no choice but to follow this lead. Since the forces that produced this result in higher education sprang up largely outside of our institutions of learning, the movement is not likely to cease till the common school has been changed in the same way. The educational question of the future is not whether historical or natural science or formal studies are to monopolize the school course, but rather how these

three indispensable elements of every child's education may be best harmonized and wrought into a unit.

We are now in a position to give a concluding estimate upon the relative value of these three elements in school education. History contributes the materials from which motives and moral impulses spring. It cultivates and strengthens moral convictions by the use of inspiring examples. The character of each child should be drawn into harmony with the highest impulses that men have felt. A desire to be the author of good to others should be developed into a practical ruling motive. Natural science on the other hand supplies a knowledge of the ordinary means and appliances by which the purposes of life are realized. It gives us proper insight into the conditions of life and puts us into intelligent relation to our environment. Not only must a child be supplied with the necessities of life but he must appreciate the needs of health and understand the economies of society, such as the necessity of mental and manual labor, the right use of the products and forces of nature, and the advantage of men's inventions and devices. In a plan of popular education these two culture elements should mingle (history and natural science). In the case of all sorts of people in society the ability to execute high moral purposes depends largely upon a ready, practical insight into natural conditions. We are not thinking of the bread-and-butter phase of life and of the aid afforded by the sciences in making a living, but of the all-round, practical utility of natural science as a necessary supplement to moral training.

One of the best tests of a system of education is the preparation it gives for life in a liberal sense. When a child, leaving school behind, developes into a citizen,

what tests are applied to him? The questions submitted to his judgment in his relations to the family and to society call for a quick and varied knowledge of men, insight into character, and for a large amount of practical information of natural science. He is asked to vote intelligently on social, political, sanitary and economic questions, to judge of men's motives, opinions and character, to vote upon or perhaps to direct the management of poor-houses, asylums and penitentiaries, in towns to decide questions of drainage, police, water supply, public health and school administration, to make contracts for public buildings, and bridges, to grant licenses, and franchises, to serve on juries or as representatives of the people. These are not professional matters alone, they are the common duties of all citizens of a sound mind. These things each person should know how to judge, whether he be a blacksmith, a merchant or a house-keeper. In all such matters he must be not only a judge of others but an actor under the guidance of right motives and information. Again, in the bringing up of children, in the domestic arrangements of every home and in a proper care for the minds and bodies of both parents and children a multitude of practical problems from each of the great fields of real knowledge must be met and solved.

A medical missionary illustrates this combination of historical and natural science elements. His life purpose is drawn from history, from the life of Christ and from the traditional incentives of the church. The means by which he is to make himself practically felt are obtained from his study of medicine and from the sciences upon which it depends. These elements form the basis of his influence. This illustration however savors of profes-

sional rather than of general education; and we are concerned only with the latter. But the education of every child is analogous to that of the medical missionary in its two constituent elements.

As a matter of fact neither history nor natural science occupies any such prominence in the school course as we have judged fitting. Much thoughtful study, experience in teaching and pioneer labor in partially new fields will be necessary in order to bring into existence such a course of study based upon the best materials. Many teachers already recognize the necessity for it and see before them a land of plenty as compared with the half-desert barrenness revealed in our present school course.

Two powerful convictions in the minds of those responsible for education have contributed to produce this desert-like condition in children's school employments, and this brings us to a discussion of the over-estimation in which purely *formal studies* are held. The first article of faith rests upon the unshaken belief in the *practical studies*, reading, writing and arithmetic. They are still looked upon as a barrier that must be scaled before the real work of education can begin. Learn to read, write and figure and then the world of knowledge as well as of business is at your command. But many children find the barrier so difficult to scale that they really never get into the fields of knowledge. Many of our most thorough going educators still firmly believe that a child can not learn anything worth mentioning till he has first learned to read. But however deeply rooted this confidence in the purely formal work of the early school years may be, it must break down as soon as means are devised for putting the realities of interesting knowledge before and underneath all the forms of expression. Let the neces-

sity for expression spring from the real objects of study. Those children to whom the memorizing and drill upon forms of expression becomes tedious deserve our sympathy. There is a kind of knowledge adapted to arouse these dull ones to their full capacity of interest. "Or what man is there of you whom if his son ask bread will he give him a stone?" With many a child the first reader, the arithmetic or the grammar becomes a veritable stone. There is no good reason why the sole burden of work in early school grades should rest upon the learning of the pure formalities of knowledge. Children's minds are not adapted to an exclusive diet of this kind. The fact that children have good memories is no reason why their minds should be gorged with the driest memory materials. They have a healthy interest in people, whether in life or in story, and in the objects in nature around them. What is thus pre-eminently true of the primary grades is true to a large extent throughout all the grades of the common school. It seems almost curious that the more tender the plants the more barren and inhospitable the soil upon which they are expected to grow. Fortunately these little ones have such an exuberance of life that it is not easily quenched. Formal knowledge stands first in our common school course and real studies are allowed to pick up such crumbs of comfort as may chance to fall. We believe in formal studies and in their complete mastery in the common school, but they should stand in the place of service to real studies. How powerful the tendency has been and still is toward pure formal drill and word memory is apparent from the fact that even geography and history, which are not at all formal studies, but full to overflowing with interesting facts and laws, have been reduced to a dry memorizing of words, phrases and stereotyped sentences.

It is not difficult to understand why the numerous body of teachers, who easily drift into mechanical methods, has a preference for formal studies. They are comparatively easy and humdrum and keeps pupils busy. Real studies, if taught with any sort of fitness, require energy, interest and versatility, besides much outside work in preparing materials.

The second article of faith is a still stronger one. The better class of energetic teachers would never have been won over to formal studies on purely utilitarian grounds. A second conviction weighs heavily in their minds. "*The discipline of the mental faculties*" is a talisman of unusual potency with them. They prize arithmetic and grammar more for this than for any direct practical value. The idea of mental discipline, of training the faculties, is so ingrained into all our educational thinking that it crops out in a hundred ways and holds our courses of study in the beaten track of formal training with a steadiness that is astonishing. These friends believe that we are taking the back-bone out of education by making it interesting. The culmination of this educational doctrine is reached when it is said that the most valuable thing learned in school or out of it is to do and to do vigorously that which is most disagreeable. The training of the will to meet difficulties unflinchingly is their aim, and we can not gain-say it. These stalwart apostles of educational hardship and difficulty are in constant fear lest we shall make studies interesting and attractive and thus undermine the energy of the will. But the question at once arises: Does not the will always act from *motives* of some sort? And is there any motive or incentive so stimulating to the will as a steady and constantly increasing *interest* in studies? It is able to surmount great difficulties.

We wish to assure our stalwart friends that we still adhere to the good old doctrine that "there is no royal road to learning." There is no way of putting aside the real difficulties that are found in every study, no way of grading up the valleys and tunneling through the hills so as to get the even monotony of a railroad track through the rough or mountainous parts of education. Every child must meet and master the difficulties of learning for himself. There are no palace cars with reclining chairs to carry him to the summit of real difficulties. The *character-developing power* that lies in the mastery of hard tasks constitutes one of their chief merits. Accepting this as a fundamental truth in education, the problem for our solution is, how to stimulate children to encounter difficulties. Many children have little inclination to sacrifice their ease to the cause of learning, and our dull methods of teaching confirm them in their indifference to educational incentives. Any child, who, like Hugh Miller or Abraham Lincoln, already possesses an insatiable thirst for knowledge, will allow no difficulties or hardships to stand in the way of progress. This original appetite and thirst for knowledge which the select few have often manifested in childhood is more valuable than anything the schools can give. With the majority of children we can certainly do nothing better than to nurture such a taste for knowledge into vigorous life. It will not do to assume that the average of children have any such original energy or momentum to lead them to scale the heights of even ordinary knowledge. Nor will it do to rely too much upon a *forcing process*, that is, by means of threats, severity and discipline, to carry children against their will toward the educational goal.

“Be not like dumb driven cattle,
Be a hero in the strife ”

is sound educational doctrine.

The thing for teachers to do is to cultivate in children all healthy appetites for knowledge, to set up interesting aims and desires at every step, to lead the approach to different fields of knowledge in the spirit of conquest.

In the business world and in professional life men and women work with abundant energy and will because they have desirable ends in view. The hireling knows no such generous stimulus. Business life is full of irksome and difficult tasks but the aim in view carries people through them. We shall not eliminate the disagreeable and irksome from school tasks but try to create in children such a spirit and ambition as will lead to greater exertions. To implant vigorous aims and incentives in children is the great privilege of the teacher. We shall some day learn that when a boy cracks a nut he does so because there may be a kernel in it, not because the shell is hard.

In concluding the discussion of relative values we will summarize the results.

History in the liberal sense surveys the field of human life in its typical forms and furnishes the best illustrative moral materials. *Nature study* opens the door to the real world in all its beauty, variety and law. The *formal studies* constitute an indispensable part of useful and disciplinary knowledge, but they should occupy a secondary place in courses of study because they deal with the *form* rather than with the *content* of the sciences. It is a fundamental error to place formal studies in the centre of the school course and to subordinate everything to their mastery. History and natural science, on the contrary, having the richest knowledge content, constitute

a natural centre for all educative efforts. They make possible a strong development of will-energy because their interesting materials furnish strong and legitimate incentives to mental activity and an enlarged field and opportunity to voluntary effort in pursuit of clear and attractive aims.

CHAPTER III.

NATURE OF INTEREST.

By interest we mean the natural bent or inclination of the mind to find satisfaction in a subject when it is properly presented. It is the natural attractiveness of the subject that draws and holds the attention. Interest belongs to the feelings but differs from the other feelings, such as desire or longing for an object, since it is satisfied with the simple contemplation without asking for possession. The degree of interest with which different kinds of knowledge are received, varies greatly. Indeed, it is possible to acquire knowledge in such a manner as to produce dislike and disgust. A proper interest in a subject leads to a quiet, steady absorption of the mind with it, but does not imply an impetuous, passionate and one-sided devotion to one thing. Interest keeps the mind active and alert without undue excitement or partiality.

It would be well if every study and every lesson could be sustained by such an interest as this. Knowledge would then consist not merely in a mastery of certain facts and formulæ, coldly turned over to the memory machine. At every step the life experience and sympathy of a child would be interwoven with the facts acquired, and eventually there would be no distinction between home knowledge and school knowledge. All would be woven together and permeated by feeling.

The interest we have in mind is intrinsic, native to the subject, and springs up naturally when the mind is brought face to face with something attractive. The things of sense in nature and the people whom we see and read about, have a perennial and inexhaustible attraction for us all. It is among these objects that poets and artists find their materials and their inspiration. We just spoke of interest, not as fluctuating and variable, but steady and persistent. It contains also the elements of ease, pleasure and needed employment, that is, in learning something that has a proper interest, there is greater ease and pleasure in the acquisition, and occupation with the object satisfies an inner need. "When interest has been fully developed, it must always combine pleasure, facility and the satisfaction of a need. We see again that in all exertions, power and pleasure are secured to interest. It does not feel the burden of difficulties, but often seems to sport with them."—*Ziller*. A natural interest is also awakened by what is strange, mysterious and even frightful, but these kinds of interest concern us from a speculative rather than pedagogical point of view.

Severe effort and exertion are a necessary part of instruction, but a proper interest in the subject will help over many difficulties. It is not at all desirable to conceal difficulties under the guise of amusement. But by means of a natural interest it is possible to bring the mind into the most favorable state of action. In opposition to a lively and humane treatment of subjects, a dry and dull routine has often been praised as the proper discipline of the mind and will. "It was a mistake," says *Ziller*, "to find in the simple pressure of difficulties a source of culture, for it is the opposite of culture. It

was a mistake to call the pressure of effort, the feeling of burden and pain a source of proper training, simply because will power and firmness of character are thus secured and preserved to youth. Pedagogical efforts looking towards a lightening and enlivening of instruction should not have been answered by an appeal to severe methods, to strict, dry and dull learning, that made no attempt to adapt itself to the natural movement of the child's mind." (Ziller, *Lehre vom E. U.*, p. 355.)

A proper interest aims, finally, at the highest form of *quiet, sustained will exertion*. The succession of steps, leading up to will energy, is interest, desire and will. Before attempting to realize the higher forms of will effort we must look to the fountains and sources out of which it springs. If a young man has laid up abundant and interesting stores of knowledge of architecture, he only needs an opportunity, and there is likely to be great will-energy in the work of planning and constructing buildings. But without this interest and knowledge, there will be no effort along this line. In like manner children cannot be expected to show their best effort unless the subject is made strongly interesting from the start, or unless interest-awakening knowledge has already been stored in the mind. To make great demands upon the will power in early school years, is like asking for ripe fruits before they have had time to mature. Knowledge, feelings and will-incentives of every sort must be first planted in the mind, before a proper will-energy can be expected. In teaching we should aim to develop will power, not to take it for granted as a ready product. As the will should ultimately control all the mental powers, its proper maturity is a later outcome of education. Even supposing that the will has considerable original

native power, it is a power that is likely to lie dormant or be used in some ill-direction, unless proper incentives are brought to bear upon it. The will is so constituted that it is open to appeal and in all the affairs of school and of life, incentives of all sorts are constantly brought to bear upon it. Why not make an effort to bring to bear the incentives that spring out of interest, that steady force, which is able to give abiding tendency and direction to the efforts? Why not cultivate those nobler incentives that spring out of culture-bringing knowledge? There are, therefore, important preliminaries to full will energy, which are secured by the cultivation of knowledge, the sensibilities and desires.

There is a common belief that any subject can be made interesting if only the teacher knows the secret of the how; if only he has proper skill. But it is hard even for a skillful workman "to make bricks without straw." It is often claimed that if there is dullness and disgust with a study it is the fault of the teacher. As Mr. Quick says, "I would go so far as to lay it down as a rule, that whenever children are inattentive and apparently take no interest in a lesson, the teacher should always look first to himself for the reason. There are perhaps no circumstances in which a lack of interest does not originate in the mode of instruction adopted by the teacher." This statement assumes that all knowledge is about equally interesting to pupils, and everything depends upon the *manner* in which the teacher deals with it. But different kinds of knowledge differ widely in their power to awaken interest in children. The true idea of interest demands that the subject matter be *in itself* interesting, adapted to appeal to a child, and to secure his participation. If the interest awakened by bringing the mind

in contact with the subject is not spontaneous, it is not genuine and helpful in the best sense. One of the first and greatest evils of all school courses has been a failure to select those subjects, which in themselves are adapted to excite the interest of children at each age of progress. If we could assume that lessons had been so arranged, we might then with Mr. Quick justly demand of a teacher a manner of teaching that must make the subjects interesting, or in other words a manner of treatment that would be appropriate to an interesting subject.

2. There are two kinds of interest that need to be clearly distinguished, *direct* interest, which is felt for the thing itself, for its own sake, and *indirect* interest which points to something else as the real source. A miser loves gold coins for their own sake, but most people love them only because of the things for which they may be exchanged. The poet loves the beauty and fragrance of flowers, the florist adds to this a mercenary interest. A snow-shovel may have no interest for us ordinarily, but just when it is needed, on a winter morning, it is an object of considerable interest. It is simply a means to an end. The kind of interest which we think is so valuable for instruction is direct and intrinsic. The life of Benjamin Franklin calls out a strong direct interest in the man and his fortunes. A humming bird attracts and appeals to us for its own sake. Indirect interest, so called, has more of the character of *desire*. A desire to restore one's health will produce great interest in a certain health resort, like the Hot Springs, or in some method of treatment as the use of Koch's lymph. The desire for wealth and business success will lead a merchant in the fur trade to take interest in seals and seal-fishing, and in beavers, trapping, etc. The wish to gain

a prize will cause a child to take deep interest in a lesson. But in all these cases desire *precedes* interest. Interest, indeed, in the thing itself for its own sake is frequently not present. It is true in many cases that indirect interest is not interest at all. It is a dangerous thing in education to substitute *indirect* for *direct* or true interest. The former often means the cultivation, primarily, of certain inordinate desires or feelings, such as rivalry, pride, jealousy, ambition, reputation, love of self. The cultivation of direct interest in all valuable kinds of knowledge, on the other hand, leads also to the cultivation of desires, but the desires thus generated are pure and generous, the desire for further knowledge of botany or history, the desire to imitate what is admirable in human actions and to shun what is mean. The desires which spring out of direct interest are elevating, while the desires which are associated with indirect interest are in many cases egotistic and selfish.

We often say that it is necessary to make a subject interesting so that it may be more palatable, more easily learned. This is the commonly accepted idea. It is a means of helping us to swallow a distasteful medicine. This sort of interest is often necessary and may be a sign of tact in teaching. But it is negative and weak in after results. So far as it produces motives at all they may be dangerous. It cannot build up and strengthen character but threatens to undermine it by cultivating wrong motives. There is no assurance that knowledge thus acquired can affect the will and bear fruit in action, even though it be the right kind of knowledge, because it is not the knowledge in this case that furnishes the incentives. The interest that is awakened in a subject because of its innate attractiveness, leaves incentives which

may ripen sooner or later into action. The higher kind of interest is direct, intrinsic, not simply receptive, but active and progressive. In the knowledge acquired it finds only incentives to further acquisition. It is life giving and is prompted by the objects themselves, just as the interest of boys is awakened by deeds of adventure and daring or by a journey into the woods. The interest in an object that springs from some other source than the thing itself, is indirect, as the desire to master a lesson so as to excel others, or gain a prize, or make a money profit out of it. In speaking of interest in school studies, teachers quite commonly have only the indirect in mind, *i. e.* the kind that leads children to take hold of and master their lessons more readily. Interest is thus chiefly a means of overcoming distasteful tasks. It is the merit of a direct or genuine interest that it aids in mastering difficulties and in addition to this gives a permanent pleasure in studies. One of the high aims of instruction is to implant a strong permanent interest in studies that will last after school days are over.

3. A live interest springs most easily out of knowledge subjects like history and natural science. Formal studies like grammar and arithmetic awaken it less easily. Herbart has classified the chief kinds and sources of interest as follows: Interest in nature apart from man, and interest in man, society, etc. In nature and natural objects as illustrated in the natural sciences there are three chief kinds of interest. *Empirical*, which is stirred by the variety and novelty of things seen. There is an attractiveness in the many faces and moods of nature. Between the years of childhood and old age there is scarcely a person who does not enjoy a walk or a ride in the open air, where the variety of plant, bird, animal

and landscape makes a pleasing panorama. *Speculative* interest goes deeper and inquires into the relations and causal connections of phenomena. It traces out similarities and sequences, and detects law and unity in nature. It is not satisfied with the simple play of variety, but seeks for the cause and genesis of things. Even a child is anxious to know how a squirrel climbs a tree or cracks a nut; where it stores its winter food, its nest and manner of life in winter. Why is it that a mole can burrow and live under ground? How is it possible for a fish to breathe in water? *Esthetic* interest is awakened by what is beautiful, grand and harmonious in nature or art. The first glance at great overhanging masses of rock, oppresses us with a feeling of awe. The wings of an insect, with their delicate tracery and bright hues, are attractive, and stir us with pleasure. The graceful ferns beside the brooks and moss stained rocks suggest fairy-land.

But stronger even than these interests which attach us to the things of nature, are the interests of humanity. The concern felt for others in joy or sorrow is based upon our interest in them individually, and is *sympathetic*. In this lies the charm of biography and the novel. Take away the personal interest we have in Ivanhoe, Quentin Durward, etc., and Scott's glory would quickly depart. What empty and spiritless annals would the life of Frederick the Great and Patrick Henry furnish? *Social* interest is the regard for the good or evil fortune of societies and nations. Upon this depends our concern for the progress of liberty and the struggle for free institutions in England and other countries. On a smaller scale clubs, fraternities and local societies of all kinds are based on the social interest. *Religious* interest finally reveals our consciousness of man's littleness and weakness, and of

God's providence. As Pestalozzi says, "God is the nearest resource of humanity." As individuals or nations pass away their fate lies in His hand.

The sources of interest therefore are varied and productive. Any one of the six is unlimited in extent and variety. Together they constitute a boundless field for a proper cultivation of the emotional as well as intellectual nature of man. A study of these sources of genuine interest and a partial view of their breadth and depth, reveals to teachers what our present school courses tend strongly to make them forget. The dull drill upon grammar, arithmetic, reading, spelling and writing, which are regarded as so important as to exclude almost everything else, has convinced many a child that school is veritably a dull place. And many a teacher is just as strongly convinced that keeping school is a dull and sleepy business. And yet the sources of interest are abundant to overflowing for him who has eyes to see. That these sources and materials of knowledge, arousing deep and lasting interests, are above other things adapted to children and to the school room, is a truth worthy of all emphasis.

4. Interest is a good test of the adaptability of knowledge. When any subject is brought to the attention at the right age and in the proper manner, it awakens in children a natural and lively feeling. It is evident that certain kinds of knowledge are not adapted to a boy at the age of ten. He cares nothing about political science or medicine or statesmanship or the history of literature. These things may be profoundly interesting to a person two or three times as old, but not to him. Other things, however, the story of Ulysses, travel, animals, geography and history, even arithmetic, may be very attractive

to a boy of ten. It becomes a matter of importance to select those studies and parts of studies for children at their changing periods of growth, which are adapted to awaken and stimulate their minds. We shall be saved then from doing what the best of educators have so frequently condemned, namely, when the child asks for bread give him a stone, or when he asks for fish give him a serpent.

The neglect to take proper cognizance of this principle of *interest* in laying out courses of study and in the manner of presenting subjects is certainly one of the gravest charges that ever can be brought against the schools. It is a sure sign that teachers do not know what it means "to put yourself in his place" to sympathize with children and feel their needs. The educational reformers who have had deepest insight into child-life, have given us clear and profound warnings. Rousseau says: "Study children, for be sure you do not understand them. Let childhood ripen in children. The wisest apply themselves to what it is important to *men* to know, without considering what children are in a condition to learn. They are always seeking the man in the child, without reflecting what he is before he can be a man." It is well for us to take these words home and act upon them.

It is worth the trouble to inquire whether it is possible to select subjects for school study which will prove essentially attractive and interesting from the age of six on. *Are* there materials for school study which are adapted fully to interest first grade children? We know that fairy stories appeal directly to them, and they love to reproduce them. Reading and spelling in connection with these tales are also stirring studies. Reading a

familiar story is certainly a much more interesting employment than working at the almost meaningless sentences of a chart or first reader. Number work when based upon objects can be made to hold the attention of little ones, at least in the last half of the first grade. They love also to see and describe flowers, rocks, plants and pictures. It probably requires more skillful teaching to awaken and hold the interest in the first grade than in the second or any higher grade unless older children have been dulled by bad instruction. On what principle is it possible to select both interesting and valuable materials for the successive grades? We will venture to answer this difficult question.

The main interest of children must be attracted by what we may call *real knowledge* subjects, that is, those treating of people (history stories, etc.,) and those treating of plants, animals and other natural objects (natural science topics). Grammar, arithmetic and spelling are chiefly form studies and have less native attraction for children. Secondly, it may be laid down as a fact of experience that children will be more touched and stimulated by particular persons and objects in nature than by any general propositions, or laws, or classifications. They prefer seeing a particular palm tree to hearing a general description of palms. A narrative of some special deed of kindness moves them more than a discourse on kindness. They feel a natural drawing toward real, definite persons and things, and an indifference or repulsion toward generalities. They prefer the story to the moral. Children are little materialists. They dwell in the sense world, or in the world of imagination with very clear and definite pictures. But while dealing with things of sense and with particulars, it is necessary in

teaching children, to keep an eye directed toward general classes and toward those laws and principles that will be fully appreciated later.

In every branch of study there are certain underlying principles and forms of thought whose thorough mastery in the lower grades is necessary to successful progress. It was a marked quality of Pestalozzi to sift out these simple elements and to master them. It is for us to make these simple elements intelligible and interesting by the use of concrete types and illustrations drawn from nature and from human life. If we speak of history and nature as the two chief subjects of study, the simple, fundamental relations of persons to each other in society, and the simple, typical objects, forces and laws of nature constitute the basis of all knowledge. These elements we desire to master. But to make them attractive to children, they should not be presented in bald and sterile outlines, but in typical forms. All actions and human relations must appear in attractive *personification*.

Persons speak and act and virtues shine forth in them. We do not study nature's laws at first, but the beautiful, typical life forms in nature, the lily, the oak, Cinderella and William Tell. For children then, the underlying ideas and principles of every study, in order to start the interest, must be revealed in the most beautiful illustrative forms which can be furnished by nature, poetry and art. The story of William Tell, although it comes all the way from the Alps and from the distant traditional history of the Swiss, is one of the best things with which to illustrate and impress manliness and patriotism. The fairy stories for still younger children, are the best means for teaching kindness or unselfishness, because they are so chaste, and beautiful, and graceful,

even to the child's thought. The most attractive type-forms and life-personifications of fundamental ideas in history and nature are the really interesting subjects of study for children. To put it in a simple, practical form—objects and human actions, if well selected, are the best means in the world to excite curiosity and the strong spirit of inquiry. While dwelling upon this thought of the attractiveness of type-forms as personified in things or persons, we catch a glimpse of a far-reaching truth in education.

The idea of *culture epochs*, as typical of the steps of progress in the race and also of the periods of growth in the child, offers a deep perspective into educational problems. In the progress of mankind from a primitive state of barbarism to the present state of culture in Europe and in the United States, there has been a succession of not very clearly defined stages. In point of government, for example, there has been the savage, nomad, patriarch, kingdom, constitutional monarchy, democracy, republic, federal republic. There have been great epochs of political convulsion in the conflicts with external powers and in civil struggles and revolutions. In the growth of handicrafts, arts, manufactures and inventions, there has been a series of advances from the time when men first began to cultivate the ground, to reduce the metals and to bring the forces of nature into service. In the development of human society, therefore, and in the progress of arts and human knowledge, there are certain typical stages whose proper use may help us to solve some of the difficult problems in educating the young. All nations have passed through some of these important epochs. The United States, for example, since the first settlements upon the east coast, have gone rap-

idly through many of the characteristic epochs of the world's history, in politics, commerce and industry, in social life, education and religion.

The importance of the culture epochs for schools lies in the fact, accepted by many great writers, that children in their growth from infancy to maturity, pass through a series of steps which correspond broadly to the historical epochs of mankind. A child's life up to the age of twenty, is a sort of epitome of the world's history. Our present state of culture is a result of growth, and if a child is to appreciate society as it now is, he must grow into it out of the past, by having traveled through the same stages it has traced. But this is only a very superficial way of viewing the relation between child and world history. The periods of child life are so similar to the epochs of history, that a child finds its *proper mental food* in the study of the materials furnished by these epochs. Let us test this. A child eight years old cares nothing about reciprocity or free silver, or university extension. Robinson Crusoe, however, who typifies mankind's early struggle with the forces of nature, claims his undivided attention. A boy of ten will take more delight in the story of King Alfred or William Tell than in twenty Gladstones or Bismarks. Not that Gladstone's work is less important or interesting to the right person, but the boy does not live and have his being in the Gladstonian age. Not all parts of history, indeed, are adapted to please and instruct some period of youth. Whole ages have been destitute of such materials, barren as deserts for educational purposes. But those epochs which have been typical of great experiences, landmarks of progress, have also found poets and historians to describe them. The great

works of poets and historians contain also the great *object lessons* upon which to cultivate the minds of children. Some of the leading characters of fiction and history are the best personifications of the steps of progress in the history of the race. Crusoe, Abraham, Ulysses, Alfred, Tell, David, Charlemagne, Moses, Columbus, Washington. These men, cast in a large and heroic mold, represent great human strivings and are adapted to teach the chief lessons of history, if properly selected and arranged. These typical individual characters, illustrate the fundamental ideas that will give insight and appreciation for later social forms. They contain, hidden as it were, the essential part of great historical and social truths of far-reaching importance. The culture epochs will be seen later to be important in solving the problem of the *concentration of instruction* along certain lines, but in the present discussion, their value is chiefly seen in their adaptability to arouse the interest of children, by supplying peculiarly congenial materials of instruction in the changing phases of child progress.

5. The cultivation of a *many-sided interest* is desirable in order to *avoid* narrowness, and to open up the various sources of mental activity, *i. e.*, to stimulate mental vigor along many lines. But this very variety of interests may lead to scattering and superficial knowledge. And in its results many-sided interest would seem to point naturally to many-sided activity, that is, to multiplicity of employments, to that character which in Yankee phrase is designated as "Jack of all trades and master of none." If instead of being allowed to spread out so much the educational stream is confined between narrow banks, it will show a deep and full current. If allowed to spread over the marshes and plains, it becomes sluggish and

brackish. Our course of study for the common schools in recent years, has been largely added to and has been extending over the whole field of knowledge. History, geography, natural science lessons, and drawing have been added to the old reading, writing, arithmetic and grammar. There may appear to be more variety, but less strength. When in addition to this greater variety of studies, enthusiastic teachers desire to increase the *quantity* of knowledge in each branch and to present as many interesting facts as possible, at every point, we have the *overloading* of the school course. This effect will be noticed in a later chapter in its bearing upon concentration. Children have too much to learn. They become pack-horses, instead of free spirits walking in the fields of knowledge. *Mental vigor* after all is worth more than a mind grown corpulent and lazy with an excess of pabulum, overfed. The cultivation therefore of a many-sided interest ceases to be a blessing as soon as encyclopedic knowledge becomes its aim. In fact the desire on the part of teachers to make the knowledge of any subject complete and encyclopedic destroys all true interest.

The solution of this great problem does not consist in identifying many-sided interest with encyclopedic knowledge, but in such a detailed study of *typical* forms in each case as will give insight into that branch without any pretension to exhaustive knowledge. Certainly a true interest in plants does not require that we become acquainted with all the species of all the genera. But a proper study of a few typical forms in a few of the families and genera might produce a much deeper interest in nature and in her laws.

The culture of a many-sided interest is essential to a full development and perfection of the mental activities.

It is easy to see that interest in any subject gives all thought upon it a greater vigor and intensity. Mental action in all directions is strengthened and vivified by a direct interest. On the other hand mental life diminishes with the loss of interest, and even in fields of knowledge in which a man has displayed unusual mastery, a loss of interest is followed by a loss of energy. Excluding interest is like cutting off the circulation from a limb.

Perfect vigor of thought which we aim at in education, is marked by strength along three lines, the vigor of the individual ideas, the extent and variety of ideas under control, and the connection and harmony of ideas. It is the highest general aim of intellectual education to strengthen mental vigor in these three directions. Many-sided interest is conducive to all three. Every thought that finds lodgment in the mind is toned up and strengthened by interest. It is also easier to retain and reproduce some idea that has once been grasped with full feeling of interest. An interest that has been developed along all leading lines of study has a proper breadth and comprehensiveness and cannot be hampered and clogged by narrow restraints and prejudice. We admire a person not simply because he has a few clear ideas, but also for the extent and variety of this sort of information. Our admiration ceases when he shows ignorance or prejudice or lack of sympathy with important branches of study.

Finally, the unity and harmony of the varied kinds of knowledge are a great source of interest. The tracing of connections between different studies and the insight that comes from proper associations, are among the highest delights of learning. The connexion and harmony of ideas will be discussed under concentration.

The six interests above mentioned are to be developed along parallel lines. They are to be kept in proper equipoise. It is not designed that any one shall be developed to the overshadowing of the others. They are like six pillars upon which the structure of a liberal education is rested. A cultivation of any one, exclusively, may be in place when the work of general education is complete and a profession or life labor has been chosen.

7. It is also true that a proper interest is a protection against the desires, disorderly impulses and passions. One of the chief ends of education is to bring the inclinations and importunate desires under mastery, to establish a counterpoise to them by the steady and persistent forces of education. A many-sided interest cultivated along the chief paths of knowledge, implies such mental vigor and such preoccupation with worthy subjects as naturally to discourage unworthy desires.

Locke says, self-restraint, the mastery over one's inclinations, is the foundation of virtue. "He that has found a way how to keep a child's spirit easy, active and free, and yet at the same time, to restrain him from many things he has a mind to, and to draw him to things that are uneasy to him; he, I say, that knows how to reconcile these seeming contradictions, has, in my opinion, got the true secret of education." But it is a secret still, the central question remains unanswered. How is the teacher to approach and influence the will of the child? Is it by supposing that the child has a will already developed and strong enough to be relied upon? On the contrary, must not the teacher put incentives in the path of the pupil, ideas and feelings that guide him to self denial?

Interest as a source of will-stimulus has peculiar ad-

vantages. It is not desired that the inclinations and feelings shall get the mastery of the mind, certainly not the disorderly and momentary desires. Higher desires, indeed, should properly influence the will, as the desire of the approval of conscience, the desire to attain excellence, to gain strength and mastery, to serve others, etc. But the importance of awakening interest as a basis of will cultivation is found in the favorable mental state induced by interest as a preliminary to will action along the best lines. Interest is not an impetuous force like the desires, prompting to instant action, but a quiet, permanent undertone, which brings everything into readiness for action, clears the deck and begins the attack. It would be a vast help to many boys and girls if the irksomeness of study in arithmetic or grammar, which is so fatal to will energy, could give way to the spur of interest, and when the wheels are once set in motion, progress would not only begin but be sustained by interest.

8. It is pretty generally agreed to by thoughtful educators, that in giving a child the broad foundations of education, we should aim not so much at knowledge as at capacity and appreciation for it. A universal receptivity, such as Rousseau requires of *Emile*, is a desideratum. Scarcely a better dowry can be bestowed upon a child by education, than a desire for knowledge and an intelligent interest in all important branches of study. Herbart's many-sided interest is to strengthen and branch out from year to year during school life and become a permanent tendency or force in later years. No school can give even an approach to full and encyclopedic knowledge, but no school is so humble that it may not throw open the doors and present many a pleasing prospect into the fields of learning.

With Herbart, therefore, a many-sided, harmonious interest promotes will-energy through all the efforts of learning from childhood up, and when the work of general education has been completed, the youth is ready to launch out into the world with a strong, healthy appetite for information in many directions. The best fruitage of such a course will follow in the years that succeed school life.

CHAPTER IV.

CONCENTRATION.

By concentration is meant such a connexion between the parts of each study and such a spinning of relations and connecting links between different sciences that unity may spring out of the variety of knowledge. History, for example, is a series and collocation of facts explainable on the basis of cause and effect, a development. On the other hand, history is intimately related to geography, language, natural science, literature and mathematics. It would be impossible to draw real history out by the roots without drawing all other studies out bodily with it. Is there then any reason why school history should ignore its blood relationships to other branches of knowledge?

Concentration is so bound up with the idea of *character forming* that it includes more than school studies. It lays hold of home influences and all the experiences of life outside of school and brings them into the daily service of school studies. It is just as important to bind up home experience with arithmetic, language and other studies as it is to see the connexion between geography and history. In the end, all the knowledge and experience gained by a person at home, at school and elsewhere should be classified and related, each part brought into its right associations with other parts.

Nor is it simply a question of throwing the varied sorts of *knowledge* into a network of crossing and inter-

woven series so that the person may have ready access along various lines to all his knowledge stores. Concentration draws the *feelings* and the *will* equally into its circle of operations. To imagine a character without feeling and will would be like thinking a watch without a mainspring. All knowledge properly taught generates feeling. The will is steadily laying out, during the formative period of education, the highways of its future ambitions and activities. Habits of willing are formed along the lines of associated thought and feeling. The more feeling and will are enlisted through all the avenues of study and experience, the more permanent will be their influence upon character.

In attempting to solve the problem of concentration the question has been raised whether a single study, the most important, of course, should constitute a concentrating nucleus, like the hub in a wheel, or whether all studies and experience are to be brought into an organic whole of related parts. It is evident that history and natural science at least hold a leading place among studies and determine to some extent the selection of materials in reading and language lessons.

Concentration evidently involves a solution of the question as to the relative value of studies. All the light that the discussion of *relative values* can furnish will be needed in selecting the different lines of appropriate study and in properly adjusting them to one another. The theory of *interest* will also aid us in this field of investigation.

Accepting therefore the results of the two preceding chapters that history (in the broad sense) is the study which best cultivates moral dispositions; secondly, that natural science furnishes the indispensable insight into

the external world, man's physical environment, and, thirdly, that language, mathematics and drawing are but the formal side and expression of the two realms of real knowledge, we have the broad outlines of any true course of education. In more definitely laying out the parts of this course the natural *interests* and capacities of children in their successive periods of growth must be taken into the reckoning. When a course of study has been laid out on this basis, bringing the three great threads or cables of human knowledge into proper juxtaposition at the various points, we shall be ready to speak of the manner of really executing the plan of concentration. Even after the general plan is complete and the studies arranged the real work of concentration consists in *fixing the relations* as the facts are learned.

Concentration takes for granted that the facts of knowledge will be acquired. It is but half the problem to learn the facts. The other half consists in understanding and fixing the relations. Most teachers will admit that each lesson should be a collection of connected facts and that every science should consist of a series of derivative lessons. And yet the study and mastery of arithmetic as a connection of closely related principles is not generally appreciated. With proper reflection it is not difficult to see that the facts of a single study like grammar or botany should stand in close serial or causal relation. If they are seen and fixed with a clear insight into these connections, by touching the chain of associations at any point one may easily bring the whole matter to remembrance.

Concentration however is chiefly concerned with the relation of different studies to each other. In this larger sense of an intimate binding together of all studies and

experience into a close network of interwoven parts, concentration is now generally ignored by the schools. In fact it would almost seem as if the purpose of teachers were to make a clear separation of the different studies from one another and to seal up each one in a separate bottle, as it were. The problem appears in two phases. 1. Taking the school studies as they now are, is it desirable to pay more attention to the natural connections between such studies as reading, geography, history and language, to open up frequent communicating avenues between the various branches of educational work? 2. Or if concentration is regarded as still more important, shall the subject matter of school studies be rearranged and the lessons in different branches so adjusted to each other that the number of close relations between them will be greatly increased? Then with the intentional increase of such connecting links would follow a more particular care in fixing them.

We have assumed the latter position, and claim that the whole construction of the school course and the whole method of teaching should contribute powerfully to the unification of all the knowledge and experience in each child's mind. Without laying any undue stress upon simple knowledge, we believe that a small amount of well articulated knowledge is more valuable than a large amount of loose and fragmentary information. A small, disciplined police force is able to cope with a large, unorganized mob. "The very important principle here involved is that the value of knowledge depends not only upon the *distinctness* and *accuracy* of the ideas, but also upon the *closeness and extent of the relations* into which they enter. This is a fundamental principle of education. It was Herbart who said, 'Only those thoughts

come easily and frequently to the mind which have at some time made a strong impression and which possess numerous connexions with other thoughts.' And psychology teaches that those ideas which take an isolated station in the mind are usually weak in the impression they make and are easily forgotten. A fact, however important in itself, if learned without reference to other facts, is quite likely to fade quickly from the memory. It is for this reason that the witticisms, sayings and scattered pieces of information, which we pick up here and there, are so soon forgotten. There is no way of bringing about their frequent reproduction when they are so disconnected. For the reproduction of ideas is largely governed by the law of association. One idea reminds us of another closely related to it; this of another, etc., till a long series is reproduced. They are bound together like the links of a chain, and one draws another along with it just as one link of a chain drags another after it. A mental image that is not one of such a series cannot hope to come often to consciousness; it must as a rule sink into oblivion, because the usual means of calling it forth are wanting." (F. McMurry, "Relation of natural science to other studies.")

We are not conscious of the constant dependence of our thinking and conversation upon the law of association. It may be frequently observed in the familiar conversation of several persons in a company. The simple mention of a topic will often suggest half a dozen things that different ones are prompted to say about it, and may even give direction to the conversation for a whole evening.

Now if it is true that ideas are more easily remembered and used if associated let us *increase the associa-*

tions. Why not bind all the studies and ideas of a child as closely together as possible by natural lines of association? Why not select for reading lessons those materials which will throw added light upon contemporaneous lessons in history, botany and geography? Then if the reading lesson presents in detail the battle of *King's Mountain*, take the pains to refer to this part of the history and put this lesson into connexion with historical facts elsewhere learned. If a reading lesson give a full description of the *palm tree*, its growth and use, what better setting could this knowledge find than in the geography of Northern Africa and the West Indies?

The numerous associations into which ideas enter, without producing confusion make them more serviceable for every kind of use. "It is only by associating thoughts closely that a person comes to possess them securely and have command over them. One's reproduction of ideas is then rapid enough to enable him to comprehend a situation quickly, and form a judgment with some safety; his knowledge is all present and ready for use; while on the other hand, one whose related thoughts have never been firmly welded together reproduces slowly and in consequence is wavering and undecided. His knowledge is not at his command and he is therefore weak." (F. McMurry.)

The greater then the number of clear mental relations of a fact to other facts in the same and in other studies the more likely it is to render instant obedience to the will when it is needed. Such ready mastery of one's past experiences and accumulations promotes confidence and power in action. Concentration is manifestly designed to give strength and decision to character. But a care-

less education by neglecting this principle, by scattering the mind's forces over broad fields and by neglecting the connecting roads and paths that should bind together the separate fields, can actually undermine force and decision of character.

The centre for concentrating efforts in education is not so much the knowledge given in any school course as the child's mind itself. We do not desire to find in the school studies a new centre for a child's life so much as the means for fortifying that original stronghold of character which rests upon native mental characteristics and early home influences. We have in mind not the objective unity of different studies considered as complete and related sciences, nor any general model to which each mind is to be conformed but the practical union of all the experiences and knowledge that find entrance into a particular mind.

The *unity of the personality* as gradually developed in a child by wise education is essential to strength of character. Ackerman says on this point, ("Ueber Concentration," p. 20.) "In behalf of character development, which is the ultimate aim of all educative effort, pedagogy requires of instruction that it aid in forming the *unity of the personality*, the most primitive basis of character. In requiring that the unity of the personality be formed it is presupposed that this unity is not some original quality, but something to be first developed. It remains for psychology to prove this and to indicate in what manner the unity of the personality originates. Now psychology teaches that the personality, the ego, is not something original, but something that must be first developed and is also changeable and variable. The ego is nothing else than a psychological phenomenon, namely,

the consciousness of an interchange between the parts of an extensive complex of ideas, or the reference of all our ideas and of the other psychical states springing out of them to each other. Experience teaches this. In infancy the ego, the personality, is consciously realized in one person sooner, in another later. In the different ages of life also the personality possesses a different content. The deeper cause for the mutual reference of all our manifold ideas to each other and for their union in a single point, as it were, may be found in the *simplicity of the soul*, which constrains into unity all things that are not dissociated by hindrance or contradiction. The soul, therefore, in the face of the varied influences produced by contact with nature and society, is active in concentrating its ideas, so that with mental soundness as a basis, the ego, once formed, in spite of all the transitions through which it may pass, still remains the same."

There is then a natural tendency of the mind to unify all its ideas, feelings, incentives. On the other hand the knowledge and experience of life are so varied and seemingly contradictory that a young person, if left to himself or if subjected to a wrong schooling, will seldom work his way to harmony and unity. In spite of the fact that the soul is a simple unit and tends naturally to unify all its contents, the common experience of life discovers in it unconnected and even antagonistic thought—and knowledge centers. People are sometimes painfully surprised to see how the same mind may be lifted by exalted sentiments and depressed by the opposite. The frequent examples that come to notice of men of superiority and virtue along certain lines, who give way to weakness and wrong in other directions, are sufficient evidence that good and evil may be systematically cultivated in the

same character, and that instead of unity and harmony education may collect in the soul heterogeneous and warring elements which make it a battle ground for life. All such disharmony and contradiction lend inconsistency and weakness to character.

Among other things tending toward consistency of character there must be harmony between the school and home life of a child. At home or among companions, perhaps unknown to the teacher, a boy or girl may be forming an habitual tendency and desire, more powerful than any other force in its life, and yet at variance to the best influence of the school. If possible the teacher should draw the home and school into a closer bond so as to get a better grasp of the situation and its remedy. The school will fail to leave an effective impress upon such a child unless it can get a closer hold upon the sympathies and thus neutralize an evil tendency. It must league itself with better home influences so as to implant its own impulses in home life. How to unify home and school influences is one of those true and abiding problems of education that appeals strongly and sympathetically to parents and teachers.

Not only can incompatible lines of thought and of moral action become established in the same person, but even those studies which could be properly harmonized and unified by education may lie in the mind so disjointed and unrelated as to render the person awkward and helpless in spite of much knowledge. In unifying the various parts of school education and in bringing them into close connexion with children's other experiences, the school life fulfills one of its chief duties.

In later years when we consider the results of school methods upon our own character we can see the weakness

of a system of education which lacks concentration, a weakness which shows itself in a lack of *retentiveness* of acquired knowledge and lack of proper *habits of thinking*. We are only too frequently reminded of the loose and scrappy state of our acquired knowledge by the ease with which it eludes the memory when it is needed. To escape from this disagreeable consciousness in after years, we begin to spy out a few of the mountain peaks of memory which still give evidence of submerged continents. Around these islands we begin to collect the wreckage of the past and the accretions of later study and experience. A thoughtful person naturally falls into the habit of collecting ideas around a few centres, and of holding them in place by links of association. In American history for instance, it is inevitable that our knowledge becomes congested in certain important epochs, or around the character and life of a few typical persons. The same seems to be true also of other studies, as geography and even geometry.

Another reason why knowledge is so poorly understood and remembered is because its application to other branches of knowledge, a little apart from the main line, are so little observed and fixed. Looking back upon our school studies we often wonder what botany, geometry and drawing have to do with our present needs. Each subject was so compactly stowed away on a shelf by itself that it is always thought of in that isolation, like Hammerfest or the Falkland Islands in geography,—out of the way places.

Are the various sciences so distinct and so widely separated in nature and in real life as they were in school? An observant boy in the woods will notice important relations between animals and plants, between plants, soil

and seasons that are not referred to in the text books. In a carpenter shop he will observe the relation of different kinds of wood, metals, and tools to each other that will surprise and instruct him. In the real life of the country or town the objects and materials of knowledge, representing the sciences of nature and the arts of life, are closely jumbled together and intimately dependent upon each other. The very closeness of connexions and the lack of orderly arrangement shown by things in life make it necessary in schools to classify and arrange into sciences. But it is a vital mistake to suppose that knowledge is complete when classified and learned in this scientific form. Classifications and books are but a faulty means of getting a clear insight into nature and human life or society. Knowledge should not only be mastered in its scientific classifications but also constantly referred back to things as seen in practical life and closely traced out and fixed in those connexions. The vital connexions of different studies with each other are best known and realized by the study of nature and society.

In later life we are convinced at every turn of the need of being able to recognize and use knowledge outside of its scientific connexions. A lawyer finds many subjects closely mingled in his daily business which were never mentioned together in text books. The ordinary run of cases will lead him through a kaleidoscope of natural science, human life, commerce, history, mathematics, literature and law, not to speak of less agreeable things. But the same is true of a physician, merchant or farmer in different ways.

Shall we answer to all this that schools were never designed to teach such things? They belong to the school of life, etc.? We are accustomed to take refuge behind

the so-called "mental discipline" that results from studies whether anything is remembered of them or not. There are doubtless certain formal habits of mind that result from study even though, like Latin, they are cast aside as an old garment at the end of school days. Transferring our argument then to this ground, is there any "habit of thinking" more valuable than that *bent of mind* which is not satisfied with the mere memorizing of a fact but seeks to interpret its value by judging of its influence upon other facts and their influence upon it? No subject is understood by itself nor even by its relation to other facts in the same science, but by its relation to the whole field of knowledge. Unless it can be proven that the study of relations is above the school-boy capacity it is doubtful if there is any mental habit so valuable at the close of school studies as the disposition to *think* and *ponder*, to trace relations.

The multiplication of studies in the common school in recent years will soon compel us to pay more attention to concentration or the mutual relation of knowledges. There is a resistless tendency to convert the course of studies into an *encyclopedia* of knowledge. To perceive this it is only necessary to note the new studies incorporated into the public school within a generation. Drawing, natural science, gymnastics and manual training are entirely new, while language lessons, history and music have been expanded to include much that is new for lower grades. Still other studies are even now seeking admission as modern languages, geometry and sewing. In spite of all that has been said by educational reformers against making the acquisition of knowledge the basis of education, the range and variety of studies has been greatly extended and chiefly through the influence of the

reformers. This expansive movement appears in schools of all grades. The secondary and fitting schools and the universities have spread their branches likewise over a much wider area of studies. We are in the full sweep of this movement along the whole line and it has not yet reached its flood.

The simplicity of the old course both in the common school and in higher institutions is in marked contrast to the present multiplicity. It was a narrow current in which education used to run but it was deep and strong. In higher institutions the mastery of Latin and of Latin authors was the *sine qua non*. In the common school arithmetic was held in almost equal honor. Strong characters have often been developed by a narrow and rigid training along a single line of duty as is shown in the case of the Jesuits, the Humanists and the more recent devotees of natural science.

As contrasted with this the most striking feature of our public schools now is their shallow and superficial work. It is probable that the teaching in lower grades is better than ever before, but as the tasks accumulate in the higher grades there is a great amount of smattering. The prospect is however that this disease will grow worse before a remedy can be applied. The first attempt to cultivate broader and more varied fields of knowledge in the common school must necessarily exhibit a shallow result. Teachers are not familiar with the new subjects, methods are not developed and the proper adjustments of the studies to each other are neglected.

No one who is at all familiar with our present status will claim that drawing, natural science, geography and language are yet properly adjusted to each other. The task is a difficult one but is being grappled by many earnest teachers.

It is obvious that the first serious effort to remedy this shallowness will be made by deepening and intensifying the culture of the new fields. The knowledge of each subject must be made as complete and detailed as possible. Well qualified teachers and specialists will of course accomplish the most. They will zealously try to teach all the important things in each branch of study. But where is the limit? The capacity of children! And it will not be long before philanthropists, physicians, reformers and all the friends of mankind will call a decisive halt. Children were not born simply to be stuffed with knowledge, like turkeys for a Christmas dinner.

It appears therefore that we must steer between Scylla and Charybdis, or that we are in a first-class educational dilemma. This conviction is strengthened by the reflection that there is no escape from fairly facing the situation. Having once put our hand to the plow we can not look back. The common school course has greatly expanded in recent years and there is no probability that it will ever contract. It has expanded in response to proper universal educational demands. For we may fairly believe that most of the studies recently incorporated into the school course are essential elements in the education of every child that is to grow up and take a due share in our society. It is too late to sound the retreat. The educational reformers have battled stoutly for three hundred years for just the course of study that we are now beginning to accept. The edict can not be revoked, that every child is entitled to an harmonious and equable development of all its human powers, or as Herbart calls it, a harmonious culture of many-sided interest. The nature of every child imperatively demands such broad

and liberal culture, and the varied duties and responsibilities of the citizen make it a practical necessity. No narrow, one-sided culture will ever equip a child to act a just part in the complex social, political and industrial society of our time. But the demand for *depth* of knowledge is just as imperative as that for *comprehensiveness*.

It is clear that two serious dangers threaten the quality of our education: First, loose and shallow knowledge; second, overloading with encyclopedic knowledge. What can concentration do to remedy the one and check the other? The cure for these two evils will be found in so adjusting the studies to each other, in so building them into each other, as to secure a mutual support.

The study of a topic not only as it is affected by others in the same subject, but also by facts and principles in other studies, is an antidote against superficial learning. In tracing these casual relations, in observing the resemblances and analogies, the interdependence of studies, as geography, history and natural science, a thoughtfulness and clearness of insight are engendered quite contrary to loose and shallow study.

Secondly. Concentration at once discards the idea of encyclopedic knowledge as an aim of school education. It puts a higher estimate upon related ideas and a lower one upon that of complete or encyclopedic information. All the cardinal branches of education indeed shall be taught in the school, but only the *essential*, the *typical*, will be selected and an exhaustive knowledge of any subject is out of the question. Concentration will put a constant check upon over-accumulation of facts, and will rather seek to strengthen an idea by association with familiar things than to add a new fact to it. No matter how thorough and enthusiastic a specialist one may be,

he is called upon to curtail the quantity of his subject and bring it into proper dependence upon other studies.

Historically considered the principle of concentration has been advocated and emphasized by many writers and teachers. The most striking and decided attempt to apply it was made by Jacotot in the first quarter of this century and had great success in France. Mr. Joseph Payne in interpreting Jacotot (*Lectures on the Science and Art of Ed.* p. 339) lays down as his main precept, "Learn something thoroughly and refer everything else to it." He emphasized above everything else *clearness* of insight and *connexion* between the parts of knowledge. It was principally applied to the study of languages and called for perfect memorizing by incessant repetition and rigid questioning by the teacher to insure perfect understanding, in the first instance, of new facts acquired, and secondly firm association with all previous knowledge. Jacotot and his disciples reached notable results by an heroic and consistent application of this principle and some of our present methods in language are based upon it. But on the whole the principle was only partially and mechanically applied. Its aim was primarily intellectual, even linguistic, not moral. There was no philosophical effort made to determine the relative value of studies and thus find out what study or series of studies best deserved to take the leading place in the school course. The importance of *interest*, as a means of rousing mental vigor and as a criterion for selecting concentrating materials suited to children at different ages, was overlooked.

A kind of concentration has long been practiced in Germany and to a considerable extent in our own schools which is known as the *concentric circles*.

In our schools it is illustrated by the treatment of geography, grammar, and history. In beginning the study of geography in the third or fourth grade it has been customary to outline the whole science in the first primary book. The earth as a whole and its daily and yearly motion, the chief continents and oceans, the general geographical notions, mountain, lake, river, etc., are briefly treated by definition. Having completed this general framework of geographical knowledge during the first year, the second year, or at least the second book, takes up the *same round of topics* again and enters into a somewhat fuller treatment of continents, countries, states, and political divisions. The last two years of the common school may be spent upon a large, complete geography, which, with larger, fuller maps and more names, gives also a more detailed account of cities, products, climate, political divisions, and commerce. Finally physical geography is permitted to spread over much the same ground from a natural-science standpoint giving many additional and interesting facts and laws concerning zones, volcanoes, ocean beds and currents, atmospheric phenomena, geologic history, etc. The same earth, the same lands and oceans furnish the outline in each case, and we travel over the same ground three or four times successively, each time adding new facts to the original nucleus. There is an old proverb that "repetition is the mother of studies," and here we have a systematic plan for repetition extending through the school course with the advantage of new and interesting facts to add to the grist each time it is sent through the mill. It is an attractive plan at first sight, but if we appeal to experience are we not reminded rather that it was dull repetition of names, boundaries, location of places, etc.,

and after all not much detailed knowledge was gained even in the higher grades? Again, is it not contrary to reason to begin with definitions and general notions in the lower grades and end up with the interesting and concrete in the higher?

In language lessons and grammar it has been customary to learn the kinds of sentence and the parts of speech in a simple form in the third and fourth grades and in each succeeding year to review these topics, gradually enlarging and expanding the definitions, inflexions, and constructions into a fuller etymology and syntax. In United States history we are beginning to adopt a similar plan of repetitions, and the frequent reviews in arithmetic are designed to make good the lack of thoroughness and mastery which should characterize each successive grade of work. The course of religious instruction given in European schools is based upon the same reiteration year by year of essential religious ideas. The whole plan, as illustrated by different studies, is based upon a successive enlargement of a subject in concentric circles with the implied constant repetition and strengthening of leading ideas. A framework of important notions in each branch is kept before the mind year after year, repeated, explained, enlarged with faith in a constantly increasing depth of meaning. There is no doubt that under good teaching the principle of the concentric circles produces some excellent fruits, a mastery of the subject and a concentration of ideas within the limits of a single study.

The disciples of Herbart, while admitting the merits of the concentric circles, have subjected the plan to a severe criticism. They say it begins with general and abstract notions and puts off the interesting details to

the later years, while any correct method with children will take the interesting particulars first and by a gradual process of comparison and induction reach the general principles and concepts at the close. It inevitably leads to a dull and mechanical repetition instead of cultivating an interesting comparison of new and old and a thoughtful retrospect. It is a clumsy and distorted application of the principle of apperception, of going from the known to the unknown. Instead of marching forward into new fields of knowledge with a proper basis of supplies in conquered fields, it gleans again and again in fields already harvested. For this reason it destroys a proper interest by hashing up the same old ideas year after year. Finally the concentric circles are not even designed to bring the different school studies into relation to each other. At best they contribute to a more thorough mastery of each study. They leave the separate branches of the course isolated and unconnected, an aggregation of unrelated thought complexes. True concentration should leave them an organic whole of intimate knowledge relations, conducing to strength and unity of character.

There is a growing conviction among teachers that we need a closer articulation of studies with one another. The expansion of the school course over new fields of knowledge and the multiplication of studies already discussed compels us to seek for a simplification of the course. A hundred years ago, yes even fifty years ago, it was thought that the extension of our territory and government to the present limits would be impossible. It was plainly stated that one government could never hold together people so widely separated. Mr. Fiske says: (The Critical Period of Am. Hist., p. 60) "Even with all other conditions favorable, it is doubtful if the Ameri-

can Union could have been preserved to the present time without the railroad. Railroads and telegraphs have made our vast country, both for political and for social purposes, more snug and compact than little Switzerland was in the middle ages or New England a century ago." The analogy between the realm of government and of knowledge is not at all complete but it suggests at least the change which is imperatively called for in education. In education as well as in commerce there must be trunk lines of thought which bring the will as monarch of the mind into close communication with all the resources of knowledge and experience.

Besides the central trunk lines of knowledge in history and natural science there are branches of study which are tributary to them, which serve also as connecting chains between more important subjects. Reading for instance is largely a relative study. Not only is the art of reading merely a preparation for a better appreciation of history, geography, arithmetic, etc., but even the subject matter of reading lessons is now made largely tributary to other studies. The supplementary readers consist exclusively of interesting matter bearing upon geography, history and natural science. It is a fact that reading is becoming more and more a relative study, and selections are regularly made to bear on other school work. Geography especially serves to establish a network of connexions between other kinds of knowledge. It is a very important supplement to history. In fact history cannot dispense with its help. Geography lessons are full of natural science, as with plants, animals, rocks, climate, inventions, machines and races. Indeed there are few if any school studies which should not be brought into close and important relations to geography. Again

the more important historical and scientific branches not only receive valuable aid from the tributary studies but they abundantly supply such aid in return. Language lessons should receive all their subject matter from history and natural science. While the language lessons are working up such rich and interesting materials for purposes of oral and written language, the more important branches are also illustrated and enriched by the new historical and scientific subjects thus incidentally treated.

An examination of these mutual relations and courtesies between studies may discover to us the fact that we are now unconsciously or thoughtlessly *duplicating* the work of education to a surprising extent. For example, by isolating language lessons and cutting them off from communication with history, geography and natural science, we make a double or triple series of lessons necessary where a single series would answer the purpose. Moreover by excluding an interesting subject matter derived from other studies the interest and mental life awakened by language lessons are reduced to a minimum. Interest is not only awakened by well selected matter taken from other branches but the relationships themselves between studies, whether of cause and effect as between history and geography, or of resemblance as between the classifications in botany and grammar—the relations themselves are matters of unusual interest to children.

Many teachers have begun to realize in some degree the value of these relations, their effect in enlivening studies and the better articulation of all kinds of knowledge in the mind. But as yet all attempts among us to properly relate studies are but weak and ineffective approaches toward the solution of the great problem of concentration. The links that now bind studies together in

our work are largely accidental and no great stress has been laid upon their value, but if concentration is grappled with in earnest it involves relations at every step. Not only are the principal and tributary branches of knowledge brought into proper conjunction but there is constant forethought and afterthought to bring each new topic into the company of its kindred near and remote. The mastery of any topic or subject is not clear and satisfactory till the grappling hooks that bind it to the other kinds of knowledge are securely fastened.

Concentration on a large scale and with consistent thoroughness has been attempted in recent years by the scholars and teachers of the Herbart school. It is based upon moral character as the highest aim, and upon a correlation of studies which attributes a high moral value to historical knowledge and consequently places a series of historical materials in the centre of the school course. The ability of the school to affect moral character is not limited to the personal influence of the teacher and to the discipline and daily conduct of the children, but instruction itself by illustrating and implanting moral ideas, and by closely relating all other kinds of knowledge to the historical series, can powerfully affect moral tendency and strength. If historical matter of the most interesting and valuable kind be selected for the central series, and the natural sciences and formal studies be closely associated with it, there will be harmony and union between the culture elements of the school course.

THE CULTURE EPOCHS.

The problem that confronts us at the outset, when preparing a plan of concentration, is *how to select* the best historical (moral educative) materials, which are to

serve as the central series of the course. The *culture epochs* (cultur-historische Stufen) are, according to the Herbartians, the key to the situation. (This subject was briefly discussed under *Interest*.)

According to the theory of the *culture epochs*, the child, in its growth from infancy to maturity, is an epitome of the world's history and growth in a profoundly significant sense for the purpose of education. From the earliest history of society and of arts, from the first simple family and tribal relations and from the time of the primitive industries, there has been a series of upward steps toward our present state of culture (social, political and economic life). What relation the leading epochs of progress in the race bear to the steps of change and growth in children has become a matter of great interest in education. The assumption of the *culture epochs* is that the growth of moral and secular ideas in the race, represented at its best, is similar to their growth in children and that children may find in the representative historical periods select materials for moral and intellectual nurture and a natural access to an understanding of our present condition of society. The culture epochs are those representative periods in history which are supposed to embody the elements of culture suited to train the young upon. Goethe says, "Childhood must always begin again at the first and pass through the epochs of the world's culture." Herbart says, "The whole of the past survives in each of us," and again, "The receptivity (of the child) changes continually with progress in years. It is the function of the teacher to see to it that these modifications advance steadily in agreement with these changes (in the world's history)." Ziller has attempted more fully to "justify

this culture-historical course of instruction on the ground of a certain *predisposition* of the child's mental growth for this course." Again, "We are to let children pass through the culture development of mankind with accelerated speed." Herbart says, "The treasure of advice and warning, of precept and principle, of transmitted laws and institutions, which earlier generations have prepared and handed down to the later, belongs to the strongest of psychological forces." That is, choice historical illustrations produce a weighty effect upon the minds of children.

The culture epochs imply *an intimate union between history and natural science*, the two main branches of knowledge, at every step. The isolation between these studies, which has often appeared and is still strong, is unnatural and does violence to the unity of education historically considered. Men at all times have had physical nature in and around them. Every child is an intimate blending of historical and physical (natural science) elements. The culture epochs illustrate a *constant change and expansion of history and natural science* together and in harmony (despite the conflict between them). As men have progressed historically and socially from age to age their interpretation of nature has been modified with growing discovery, insight, invention and utilization of her resources. Children also pass through a series of metamorphoses which are both physical and psychological, changing temper and mental tendency as the body increases in vigor and strength.

The culture epochs, by beginning well back in history and tracing up the steps of progress in their origin and growth pave the way for a clear insight into our present state of culture, which is a complex of historical and nat-

ural science elements. It is comparatively easy for us to see that to understand the present political, economic and social conditions of the United States we are compelled to go back to the early settlements with their simple surroundings and slowly trace up the growth and increasing complexity of government, religion, commerce, manufactures and social life. The theory of the culture epochs implies that the child began where primitive man began, feels as he felt and advances as he advanced, only with more rapid strides, that as his physique is the hereditary outcome of thousands of years of history and his physical growth the epitome of that development, so his mental progress is related to the mind progress of his ancestry. They go still further and assume that the subject matter of the leading epochs is so well adapted to the changing phases and impulses of child life that there is a strong predisposition in children in favor of this course and that the series of historical object lessons stirs the strongest intellectual and moral interests into life.

As a theory the culture epochs may seem too loose and unsubstantial to serve as the basis for such a serious undertaking as the education of children to moral character. The real test, fortunately, of the value of this theory is not so much in a general argument as in the application of the materials selected by it to school problems.

There are however certain limits to the theory of race progress that need to be drawn at once. It is easy to perceive that not all races have left such epochs behind them, because some are still in barbarism, others have advanced to a considerable height and then retrograded. Of those which have advanced with more or less steadiness for two thousand years, like England, France and Germany, not every period of their history contains val-

uable culture elements. The great epochs are not clearly distinguishable in their origin and ending. Again, only those periods whose deeds, spirit and tendency have been well preserved by history or, still better, have found expression in the work of some great poet or literary artist, can supply for children the best educative material.

The typical epochs of the world's struggle and progress, as reflected in the literary masterpieces of great writers, are the educative centres for the school. The history of each nation that has had a progressive civilization contains such elements and masterpieces. It would be fortunate for each nation if it could find first in its own history all such leading epochs and the corresponding materials. Then it could draw upon the historical and literary resources of other countries to complete and round out the horizon of thought.

Ziller, as a disciple of Herbart, was the first to lay out a course of historical study for the common school based upon the culture epochs. Since religious instruction has always been an important study in German schools, he was able to establish a double historical series throughout the eight grades of the common school; the first scriptural, representing the chief epochs of Jewish history from the time of Abraham to the end of Christ's ministry, the second, national German history from the early traditional stories of Saxony and Thuringia to the Napoleonic wars and the entry of Emperor William into Paris in 1871. It should be remarked that in the first and second grades fairy stories and Robinson Crusoe are used and the regular historical series does not begin till the third grade. The two series of sacred and profane history are designed to illustrate for each grade corresponding epochs of national history, both Jewish and

German. In the fourth grade, for instance, the Bible history from the time of Moses to Solomon corresponds to the period represented by the Nibelungen song in German tradition.

For each grade is selected a body of classical, historical materials representing a great period of German as well as Jewish life, and especially suited to interest the children and illustrate morals. A full course for the eight grades of the common schools with this double historical series as a nucleus, has been carefully worked out and applied in a number of German schools.

The Jewish and German historical materials, which are made the moral-educative basis of the common school by the Herbartians, can be of no service to us except by way of example. Neither sacred nor German history can form any important part of an American course of study. Religious instruction has been delegated to the church and German history touches us indirectly if at all. The epochs of history from which American schools must draw are chiefly those of the United States and Great Britain. France, Germany, Italy and Greece may furnish some collateral matter, as the story of Tell, of Siegfried, of Alaric and Ulysses, but the leading epochs must be those of our own national history.

Has the English-speaking race in North America passed through a series of historical epochs which, on account of their moral-educative worth, deserve to stand in the centre of a common school course? Is this history adapted to cultivate the highest moral and intellectual qualities of children as they advance from year to year? There are few if any single nations whose history could furnish a favorable answer to this question. The English in America began their career so late in the world's history

and with such advantages of previous European culture that several of the earlier historical epochs are not represented in our country. But perhaps Great Britain and Europe will furnish the earlier links of a chain whose later links were firmly welded in America.

The history of our country since the first settlements less than three hundred years ago is by far the best epitome of the world's progress in its later phases that the life of any nation presents. On reaching the new world the settlers began a hand-to-hand, tooth-and-nail conflict with hard conditions of climate, soil and savage. The simple basis of physical existence had to be fought for on the hardest terms. The fact that everything had to be built up anew from small beginnings on a virgin soil gave an opportunity to trace the rise of institutions from their infancy in a Puritan dwelling or in a town meeting till they spread and consolidated over a continent. In this short time the people have grown from little scattered settlements to a nation, have experienced an undreamed-of material expansion, have passed through a rapid succession of great political struggles and have had an unrivaled evolution of agriculture, commerce, manufactures, inventions, education and social life. All the elements of society, material, religious, political and social have started with the day of small things and have grown up together.

There is little in our history to appeal to children below the fourth grade, that is, below ten years; but from the beginning of the fourth grade on American history is rich in moral-educative materials of the best quality and suited to children. We are able to distinguish four principal epochs: 1. The age of pioneers, the ocean navigators like Columbus, Drake and Magellan, and the ex-

plorers of the continent like Smith, Champlain, LaSalle and Fremont. 2. The period of settlements, of colonial history and of French and Indian wars. 3. The Revolution and life under the Articles of Confederation till the adoption of the Constitution. 4. Self-government under the Union and the growth and strengthening of the federal idea. While drawing largely upon general history for a full and detailed treatment of a few important topics in each of these epochs we should make a still more abundant use of the *biographical* and *literary* materials furnished by each. The concentration of school studies, with a historical series suggested by the culture epochs as a basis, would utilize our American history, biography and literature in a manner scarcely dreamed of heretofore.

We shall attempt to illustrate briefly this concentration of studies about materials selected from one of the culture epochs. Take, for example, *the age of pioneers* from which to select historical subject-matter for children of the fourth and fifth grades. It comprehends the biographies of eminent navigators and explorers, pioneers on land and sea. It describes the important undertakings of Columbus, Magellan, Cabot, Raleigh, Drake and others, who were daring leaders at the great period of maritime discovery. The pioneer explorers of New England and the other colonies bring out strongly marked characters in the preparatory stage of our earliest history. Smith, Champlain, Winthrop, Penn, Oglethorpe, Stuyvesant and Washington are examples. In the Mississippi valley De Soto, La Salle, Boone, Lincoln and Robertson are types. Still farther west Lewis and Clarke, and the pioneers of California complete this historical epoch in a series of great enterprises.

Most of them are pioneers into new regions beset with dangers of wild beasts, savages and sickness. A few are settlers, the first to build cabins and take possession of land that was still claimed by red men and still covered with forests. The men named were leaders of small bands sent out to explore rivers and forests or to drive out hostile claimants at the point of the sword. Any one who has tried the effect of these stories upon children of the fourth grade will grant that they touch a deep native interest. But this must be a genuine and permanent interest to be of educative value. The moral quality in this interest is its virtue. Standish, Boone, La Salle and the rest were stalwart men, whose courage was keenly and powerfully tempered. They were leaders of men by virtue of moral strength and superiority. Their deeds have the stamp of heroism and in approving them the moral judgments of children are exercised upon noble material. These men and stories constitute an epoch in civilization because they represent that state which just precedes the first form of settled society. In fact some of the stories fall in the transition stage, where men followed the plow and wielded the woodman's axe, or turned to the warpath as occasion required. In every part of the United States there has been such a period and something corresponding to it in other countries. We are prepared to assume therefore that these historical materials arouse a strong interest, implant moral ideas and illustrate a typical epoch. They are also very real. These men, especially the land pioneers, were our own predecessors, traversing the same rivers, forests and prairies where we now live and enjoy the fruits of their hardihood and labor.

Let us suppose that such a historical series of stories has its due share of time on the school program and that

the stories are properly presented by the teacher and orally reproduced by the pupils, into what relations shall the other studies of the school enter to these historical materials? How shall language, reading, geography, natural science and arithmetic be brought into the close relation to history required by the idea of concentration.

The oral reproduction of the stories by the children is the best possible oral *language* drill, while their partial written review is the basis of much of the regular composition work. Language lessons on isolated and unconnected topics can be thus entirely omitted. The element of interest will be added to oral and written language lessons by the use of such lively stories.

Reading is chiefly tributary to the historical series. Such selections should be made for reading lessons as will throw additional light upon pioneer history and its related geography. Descriptions of natural scenery and choice selections from our best historians, as Irving and Bancroft, describing events or men of this period, should be used for reading lessons. Especially the best literary selections are to be utilized, as The Landing of the Pilgrims, Webster's and Everett's orations at Plymouth, Evangeline and Hiawatha, Indian legends and life, Miles Standish, The Knickerbocker history, and some of the original papers and letters of the early settlers. Whatever poems or prose selections from our best literature are found to bear directly or indirectly upon pioneer events will add much interest and beauty to the whole subject. A second series of reading materials for these grades would be those masterpieces and traditions of European literature, which are drawn from a corresponding pioneer epoch in those countries. For example, Siegfried in Germany, Alaric in Italy, and Ulysses in Greece.

A selection of reading material along these lines would exhibit much variety of prose and poetry, history and geography. Unity would be given to it by the spirit and labors of a typical age and an intimate relation to history at all points established.

Geography has an equally close relation to history stories. For these grades geography and history cover the same geographical regions. Instead of being totally isolated from each other they should be purposely laid out on parallel lines with interlacing topics. North America and the Atlantic ocean are the field of action in both cases. These maritime explorers opened up the geography of this hemisphere at its most interesting stage. No part of the Atlantic ocean or of its North American coasts was overlooked by the navigators. The climate, vegetation, and people upon its islands and coasts were curious objects to European adventurers. The first pioneers surveyed the eastern coast and adjacent interior of a new continent with its bays, rivers, forests, and mountains. The stories themselves are not intelligible without full geographical explanations, and the personal interest in the narratives throws a peculiar charm upon the geography.

The Mississippi valley is a great field for both history and geography. It is one of the striking physical features of North America and the best of stories find their setting in this environment. Not a great river of this region but is the scene of one of the stories. The lakes and streams were the natural highways of the explorers and settlers. The mountains obstructed their way, presenting obstacles but not limits to their enterprise. The great forests housed their game, concealed their enemies, and had to be cut down to make space for their homes and cornfields. The prairies farther

west were a camping ground for them as well as for the deer and buffalo. There are no important physical features of the great valley that are not touched more or less in detail by the stories. It is the work of the geography of this year to enlarge and complete the pictures suggested by the stories, to multiply details, to compare and arrange and to associate with these the facts of our present political and commercial geography.

The relation between history and geography is so intimate that it requires some pedagogical skill to determine which of the two should take the lead. But we have already adjudged the history to be by far the more important of the two. Its subject matter is of greater intrinsic interest to children, and as it already stands in the commanding center of the school course, we are disposed to bring the geography lessons into close dependence upon it.

In these grades *natural science* or nature study form a necessary complement to the circle of historical and geographical topics treated. Many interesting natural science subjects suggested by history and geography can not be dealt with satisfactorily in those studies, for example, the palm-tree, the squirrel, the mariner's compass. Natural science studies begin naturally with the home neighborhood, with its plants, trees, animals, rocks, inventions and products. But having surveyed and learned many of these things at home in his earlier years the child is prepared, when geography and history begin, to extend his natural science information to the larger geographical regions.

The history, stories and geography suggest a large number of natural science topics so that there is abundant choice of materials while remaining in close con-

nexion with those studies. The vegetable and animal life and products of the sea are suggested by the voyages, such as fishes, dolphins, whales, sea-birds, shells. Also the construction of ships, the mariner's compass and astronomical topics.

The stories of the land pioneers open up a still richer field of natural science study for the common schools. Among animals are the beaver, otter, squirrel, coon, bear, fox, wildcat, deer, buffalo, domestic animals, wild turkeys, ducks, pigeons, eagle, hawk, wild bees, cat fish, sword-fish, turtle, alligator and many more. Among native products and fruits are mentioned corn, pumpkins, beans, huckleberries, grapes, strawberries, cranberries, tobacco, paw paw, mulberry, haw, plum, apple and persimmon. Of trees are the oak, hickory, walnut, cypress, pine, birch, beech and others. Tools, instruments and inventions are mentioned with their uses, as guns, Indian weapons, compass, thermometer, barometer, boats, carpenter's tools; also, the uses of iron, lead, leather and many of the simple arts and economies of life, such as weaving, tempering of metals, tanning and cooking. The natural wonders of the country, such as falls, caves, hot springs, canons, salt licks, plains, interior deserts and salt lakes, kinds of rocks, soils, forests and other vegetation, the phenomena of the weather and differences in climate are referred to. All these and other topics from the broad realm of nature are suggested, any of which may serve as the starting point for a series of science lessons.

How far the natural science lessons can heed the suggestions of history and geography and still follow out and develop important science principles is one of the great problems for solution. It would seem that the

large number of natural science topics touched upon by the history, when increased by the variety of home objects in nature and by still others called up by the geography work of these years, would give sufficient variety to the natural science work of the same period. By omitting some of these topics and enlarging upon others, developing the notions of classes and principles so far as is desirable, the natural science lessons may be made sufficiently scientific without losing the close relation to the central subject matter for the year. There is no doubt but the science lessons will add greatly to many topics suggested by the stories and will bring the whole realm of nature into close relation to history and geography.

The subjects thus far discussed, that may be brought into close relation to the central stories, are oral and written language, reading and literature, geography and the natural sciences. The connexions between these branches are numerous and strong at every step.

Arithmetic, finally, seems to stand like an odd sheep among the studies. It is certainly the least social of the common school branches. While avoiding all forced connexion between arithmetic and other studies, we shall find some points where the relations are simple and clear. Children in the first grade should see numbers in the leaves, flowers, trees and animals they study. At the beginning of the first grade this would be a good informal way of beginning numbers. The value of *objects* in first and second grade number is so great that it is only a question as to how far the objects suggested by other lessons may be used.

But we are speaking of concentration in the fourth and fifth grades. In the stories and in geography we deal with journeys up great rivers, with the height of

mountains, with the extent of valleys and lakes, with regular forts, mounds and enclosures, with companies and bodies of men, with railroads, cities and agricultural products, and with many other topics which suggest excellent practical problems in arithmetic for these grades. All such careful arithmetical computations add clearness and definiteness to historical and geographical ideas. The natural sciences have been so little systematically taught in our common schools, that we are scarcely able to realize what connexion may be made between them and arithmetic. We know that in the advanced study and applications of some of the natural sciences, mathematics is an essential part.

A brief retrospect will make it appear that the history stories, natural sciences, and geography, with the more formal studies, such as reading, language, and arithmetic, may be brought into a close organic harmony. Each of them depends upon and throws light upon the other, and while the connexions are natural, not forced, there is a concentration upon the central historical and literary matter that makes moral character the highest aim of teaching. Since real concentration is practically a new educational undertaking, it involves a number of unsolved subordinate problems; for instance, how far shall science lessons, grammar, and geography follow their own principles of selection, based on the nature and scientific arrangement of their materials, while keeping up the dependence upon and connexions with the central subject. But if concentration is a true principle of education, it is evident that none of these problems can be solved until concentration has been agreed upon and made fundamental. In this case those teachers who are trying to lay out courses of study in geography, natural science,

or history without regard to the relation of studies to each other, will have most of their work to do over again.

A little reflexion will convince us perhaps that a year's work thus concentrated will produce a much more powerful and lasting impression upon children than the loose aggregation of facts which is usually collected during a year's work. Not only will the moral effect be intensified but the close dependence of each study upon the others will be perceptibly felt as valuable and stimulating to the children.

If now we can conceive of the eight grades of the common school as eight stages passing naturally from one to another, each a unit composed of a net-work of well related facts, but the epochs closely related to each other in a rising series, from childhood almost to maturity, or from the beginning of history up to the present state of culture, we shall be able also to think of education as a succession of powerful culture influences, that will bring the child to our present standpoint fully conscious of his duties and surroundings.

CHAPTER V.

APPERCEPTION.

We have observed how *interest* aids concentration by bringing all kinds of knowledge into close living relation to the feelings. Interest incentives are put into every kind of information to stimulate the will, which in turn unifies all the mind activities and brings them under control. The *culture epochs* also contribute powerfully to concentration by furnishing a principle for the selection of a series of historical masterpieces which become the rallying-points for all educative efforts. A still more powerful and persistent means of concentration is found in applying the principle of *apperception*. Every day and hour of school labors illustrate its value and teachers should find in it a constant antidote to faulty methods.

Apperception may be roughly defined at first as the process of acquiring new ideas by the aid of old ideas already in the mind. It makes the acquisition of new knowledge easier and quicker. Not that there is any easy road to learning, but there is a natural process which greatly accelerates the progress of acquisition, just as it is better to follow a highway over a rough country than to betake one's self to the stumps and brush. For example, if one is familiar with peaches, apricots will be quickly understood as a similar kind of fruit, even though a little strange. A person who is familiar with electrical machinery will easily interpret the meaning and purpose of every part of a new electrical plant. One may *perceive* a new object without understanding it, but to *apperceive*

it is to interpret its meaning by the aid of similar familiar notions.

If one examines a *type-writer* for the first time, it will take some pains and effort to understand its construction and use, but after examining a Remington, another kind will be more easily understood, because the principle of the first interprets that of the second. Suppose the *Steppes of Russia* are mentioned for the first time to a class. The word has little or no meaning or perhaps suggests erroneously a succession of stairs. But we remark that the steppes are like the prairies and plains to the west of the Mississippi River, covered with grass and fed on by herds. By awakening a familiar notion already in the mind and bringing it distinctly to the front, the new thing is easily understood. Again a boy goes to town and sees a *banana* for the first time, and asks. "What is that? I never saw anything like that." He thinks he has no class of things to which it belongs, no place to put it. His father answers that it is to eat like an orange or a pear, and its whole significance is at once plain by the reference to something familiar.

Again, two men, the one a *machinist* and the other an observer unskilled in machines, visit the machinery hall of an exposition. The machinist observes a new invention and finds in it a new application of an old principle. As he passes along from one machine to another he is much interested in noting new devices and novel appliances and at the end of an hour he leaves the hall with a mind enriched. The other observer sees the same machines and their parts but does not detect the principle of their construction. His previous knowledge of machines is not sufficient to give him the clue to their explanation. After an hour of uninterested observation

he leaves the hall with a confused notion of shafts, wheels, cogs, bands, etc., but with no greater insight into the principles of machinery. Why has one man learned so much and the other nothing? Because the machinist's previous experience served as an interpreter and explained these new contrivances, while the other had no sufficient previous knowledge and so acquired nothing new. "To him that hath shall be given." In the act of apperception the old ideas, dwelling in the mind, are not to be regarded as dead treasures stored away and only occasionally drawn out and used by a purposed effort of the memory, but they are *living forces* which have the active power of seizing and appropriating new ideas. Lazarus says they stand "like well-armed men in the inner stronghold of the mind ready to sally forth and overcome or make serviceable whatever shows itself at the portals of sense." It is then through the active aid of familiar ideas that new things find an introduction to soul life. If old friends go out to meet the strangers and welcome them, there will be an easy entrance and a quick adoption into the new home. But frequently these old friends who stand in the background of our thoughts must be awakened and called to the front. They must stand as it were on tip toe ready to welcome the stranger. For if they lie asleep in the penetralia of the home the new comers may approach and pass by for lack of a welcome. It is often necessary therefore for the teacher to revive old impressions, to call up previously acquired knowledge and to put it in readiness to receive and welcome the new. The success with which this is done is often the difference between good and poor teaching.

We are now prepared for a more accurate definition of apperception. "The transformation of a newer (weaker)

concept by means of an older one surpassing the former in power and inner organization bears the name of apperception, in contrast to the unaltered reception of the same perception." (Lindner's Psychol. p. 124, trans. by De Garmo.)

Lindner remarks further, "Apperception is the reaction of the old against the new—in it is revealed the preponderance which the older, firmer, and more self-contained concept groups have in contrast to the concepts which have just entered consciousness." Again, "It is a *kind of process of condensation of thought* and brings into the mental life a certain stability and firmness in that it subordinates new to older impressions, puts everything in its right place and in its right relation to the whole, and in this way works at that organic formation of our consciousness which we call *culture*." (Linder p. 126.)

"Apperception may be defined as that interaction between two similar ideas or thought-complexes in the course of which the weaker, unorganized, isolated idea or thought-complex is incorporated into the richer, better digested, and more firmly compacted one." (Lange, Apperception p. 13.)

Sometimes older ideas or thought masses, being clear, strong, and well-digested receive a new impression to modify and appropriate it. This is especially true where opinions have been carefully formed after thought and deliberation. A well-trained political economist, for example, when approaching a new theory or presentation of it by a George or Bellamy, meets it with all the resources of a well-stored, thoughtful mind and admits it, if at all, in a modified form to his system of thought. Sometimes however a new theory, which strikes the mind

with great clearness and vigor, is able to make a powerful assault upon previous opinions and perhaps modify or overturn them. This is the more apt to be the case if one's previous ideas have been weak and undecided. In the interaction between the old and new the latter then become the apperceiving forces. Upon the untrained or poorly-equipped mind a strong argument has a more decisive effect than it may justly deserve. New ideas, especially those coming directly through the senses, are often more vivid and attractive than similar old ones. For this reason they usually occupy greater attention and prominence at first than later when the old ideas have begun to revive and reassert themselves. Old ideas usually have the advantage over the new in being better organized, more closely connected in series and groups, and having been often repeated, they acquire a certain permanent ascendancy in the thoughts. In this interaction between similar notions, old and new, the differences at first arrest attention, then gradually sink into the background, while the strong points of resemblance begin to monopolize the thought and bind the notions into a unity.

The use of familiar notions in acquiring an insight into new things is a *natural tendency* or drift of the mind. As soon as we see something new and desire to understand it, at once we involuntarily begin to ransack our old stock of ideas to discover anything in our previous experience which corresponds to this or is like it. For whatever is like it or has an analogy to it, or serves the same uses, will explain this new thing, though the two objects be in other points essentially different. We are, in short, constantly falling back upon our old experiences and classifications for the explanation of new objects that appear to us.

So far is this true that the *most ordinary things* can only be explained in the light of experience. When John Smith wrote a note to his companions at Jamestown and thus communicated his desires to them, it was unintelligible to the Indians. They had no knowledge of writing and looked on the marks as magical. When *Columbus' ships* first appeared on the coast of the new world, the natives looked upon them as great birds. They had never seen large sailing vessels. To vary the illustration, the *art of reading*, so easy to a student, is the accumulated result of a long collection of knowledge and experience. There is an unconscious employment of apperception in the practical affairs of life that is of interest. We often see a person at a distance and by some slight characteristic of motion form or dress, recognize him at once. From this slight trace we picture to ourselves the person in full and say we saw him in the street. Sitting in my room at evening I hear the regular passenger train come in. The noise alone suggests the engine, cars, conductor, passengers and all the train complete. As a matter of fact I saw nothing at all but have before my mind the whole picture. On Sunday morning I see some one enter a familiar church door, and going on my way the whole picture of church, congregation, pastor, music and sermon come distinctly to my mind. Only a passing glance at one person entering suggests the whole scene. In looking at a varied landscape we see many things which the sensuous eye alone would not detect, distances, perspective and relative size, position and nature of objects. This apperceptive power is of vast importance in practical life as it leads to quick judgment and action, when personal examination into details would be impossible.

The general *plan of all studies* is based upon this notion of acquiring knowledge by the assistance of accumulated funds. In *Arithmetic* it would be folly to begin with long division before the multiplication table is learned. In *Geometry*, later propositions depend upon earlier principles and demonstrations. In *Latin*, vocabularies and inflections and syntactical relations must be mastered before readiness in the use of language is reached. And so it is to a large degree in the general plan of all studies. In spite of this no principle is more commonly violated in daily recitations than that of apperception. Its value is self-evident as a principle for the arrangement of topics in any branch of study, but it is overlooked in daily lessons. Instead of this new knowledge is acquired by a thoughtless memory drill.

In apperception we never pass from the known to things which are entirely new. Absolutely new knowledge is gained by perception or intuition. When an older person meets with something totally new, he either does not notice it or it staggers him. Apperception does not take place. In many cases we are disturbed or frightened, as children by some new or sudden noise or object. But most so-called new things bear sufficient resemblance to things seen before to admit of explanation. Strange as the sights of a Chinese city might appear, we should still know that we were in a city. In most "new" objects of observation or study, the familiar parts greatly preponderate over the unfamiliar. In a new reading lesson, for example, most of the words and ideas are well known, only an occasional word requires explanation and that by using familiar illustrations. The flood of our familiar and oft-repeated ideas sweeps on like a great river, receiving here and there from either side a tributary stream, that is swallowed up in its waters without perceptible increase.

So strong is the apperceiving force of familiar notions, that they drag far-distant scenes in geography and history into the home neighborhood and locate them there. The imagination works in conjunction with the apperceiving faculty and constructs real pictures. Children are otherwise inclined to substitute one thing for another by imagination. With boys and girls, geographical objects about home are often converted by fancy into representatives of distant places. It is related of *Byron* that while reading in childhood the story of the Trojan war, he localized all the places in the region of his home. An old hill and castle looking toward the plain and the sea were his Troy. The stream flowing through the plain was the Simois. The places of famous conflicts between the Trojans and Greeks were located. So vivid were the pictures which these home scenes gave to the child that years later in visiting Asia Minor and the sight of the real Troy he was not so deeply impressed as in his boyhood. A *German professor* relates that he and his companions, while reading the Indian stories of Cooper, located the important scenes in the hills and valleys about Eisenach in the Thuringian mountains. Many other illustrations of the same imaginative tendency to substitute home objects for foreign ones are given. But whether or not this experience is true of us all, it is certain that we can form no idea of foreign places and events except as we *construct* the pictures out of the *fragments* of things that we have known. What we have seen of rivers, lands, and cities must form the materials for picturing to ourselves distant places.

Important *conclusions* drawn from a study of apperception:

1. *Value of previous knowledge.* If knowledge once acquired is so *valuable* we are first of all urged to make the acquisition permanent. Thorough mastery and frequent reviews are necessary to make knowledge stick. Careless and superficial study is injurious. It is sometimes carelessly remarked by those who are supposed to be wise in educational matters that it makes no difference how much we forget if we only have proper drill and training to study. That is, how we study is more important than what we learn. But viewed in the light of apperception, acquired knowledge should be retained and used. For it unlocks the door to more knowledge. *Thorough mastery and retention* of the elements of knowledge in the different branches is the only solid road to progress. In this connexion we can see the importance of learning only what is *worth remembering*, what will prove a valuable treasure in future study. In the selection of material for school studies, therefore, we must keep in mind knowledge which, as Comenius says, is of *solid utility*. Having once selected and acquired such materials we are next impelled to make *constant use* of them. If the acquisition of new information depends so much upon the right use of previous knowledge we are called upon to build constantly upon this foundation. This is true whether the child's knowledge has been acquired at school or at home. In order to make things clear and interesting to boys and girls we must refer every day to what they have before learned in school and out of school.

Again if we accept this doctrine that old ideas are the materials out of which we constantly build *bridges* across into new fields of knowledge we must *know the children* better and what store of knowledge they have already

acquired. Just as an army marching into a new country must know well the country through which it has passed and must keep open the line of communication and the base of supplies, so the student must always have a safe retreat into his past, and a base of supplies to sustain him in his onward movements. The tendency is very strong for a grade teacher to think that she needs to know nothing except the facts to be acquired in her own grade. But she should remember that her grade is only a station on the highway to learning and life. In teaching we can not by any shift dispense with the ideas children have gained at home, at play, in the school and outside of it. This, in connexion with what the child has learned in the previous grades, constitutes a stock of ideas, a capital, upon which the teacher should freely draw in illustrating daily lessons.

2. The use of our acquired stock of ideas involves a constant *working over* of old ideas, and this working-over process not only reviews and strengthens past knowledge, keeping it from forgetfulness, but it throws new light upon it and exposes it to a many-sided criticism. In the first place familiar ideas should not be allowed to rest in the mind *unused*. Like tools for service they must be kept bright and sharp. One reason why so many of the valuable ideas we have acquired have gradually disappeared from the mind is because they remained so long unused that they faded out of sight. The old saying that "repetition is the mother of studies" needs to be recalled and emphasized. By being put in contact with new ideas, old notions are seen and appreciated in new relations. Facts that have long lain unexplained in the mind, suddenly receive a *new interpretation*, a vivid and rational meaning. Or the old meaning is intensified and vivified by putting a new fact in conjunction with it.

Where the climate and products of the British Isles have been studied in political geography, and later on in physical geography, the gulf stream is explained in its bearings on the climate of western Europe, the whole subject of the climate of England is viewed from a new and interesting standpoint. In arithmetic, where the square of the sum of the two sides of a right angled triangle is illustrated by an example and later on in geometry the same proposition is taken up in a different way and proved as a universal theorem, new and interesting light is thrown upon an old problem of arithmetic. In *United States history*, after the Revolution has been studied, the biography of a man like Samuel Adams throws much additional and vivid light upon the events and actors in Boston and Massachusetts. The life of John Adams would give a still different view of the same great events, just as a city, as seen from different standpoints, presents different aspects.

3. We have thus far shown that new ideas are more easily understood and assimilated when they are brought into close contact with what we already know; and secondly, that our old knowledge is often explained and illuminated by new facts brought to bear upon them. We may now observe the result of this double action—the *welding* of old and new into one piece, the close mingling and association of all our knowledge, i. e., its unity. Apperception, therefore, has the same final tendency that will be observed in the *inductive process*, the unification of knowledge, the concentration of all experience by uniting its parts into groups and series. The smith, in welding together two pieces of iron, heats both and then hammers them together into one piece. The teacher has something similar to do. He must revive

old ideas in the child's mind, then present the new facts and bring the two things together while they are still fresh, so as to cause them to coalesce. To prove this observe how long division may be best taught. Call up and review the method of short division, then proceed to work a problem in long division calling attention to the similar steps and processes in the two, and finally to the difference between them.

The defect of much teaching in children's classes is that the *teacher* does not properly provide for the welding together of the new and old. The important practical question after all is, whether instructors see to it that children recall their previous knowledge. It is necessary to take special pains in this. Nothing is more common than to find children forgetting the very thing which, if remembered, would explain the difficult point in the lesson. Teachers are often surprised that children have forgotten things once learned. But, in an important sense, we encourage children to forget by not calling into use their acquisitions. Lessons are learned too much, each by itself, without reference to what precedes or what follows, or what effect this lesson of to-day may have upon things learned a year ago. Putting it briefly, children and teachers do not *think* enough, pondering things over in their mind, relating facts with each other, and bringing all knowledge into unity, and into a clear comprehension. The habit of *thoughtfulness* engendered by a proper combining of old and new, is one of the valuable results of a good education. It gives the mind a disposition to glance backward and forward, to judge of all old ideas from a broader, more intelligent standpoint. Thinking everything over in the light of the best experience we can bring to bear upon it, prevents us from jumping at conclusions.

In this welding process we desire to determine how far an actual concentration may take place between school studies and the home and outside life of children. The stock of ideas and feelings which a child from its infancy has gathered from its peculiar history and home surroundings is the primitive basis of its personality. Its thought, feeling and individuality are deeply interwoven with home experience. No other set of ideas, later acquired, lies so close to its heart or is so abiding in its memory. The memory of work and play at home, of the house, yard, trees and garden, of parents, brothers and sisters and in addition to this the experiences connected with neighbors and friends, the town and surrounding country, the church and its influence, the holidays, games and celebrations, all these things lie deeper in the minds of children than the facts learned about grammar, geography or history in school. Any plan of education that ignores these home-bred ideas, these events, memories and sympathies of home and neighborhood life, will make a vital mistake. A concentration that keeps in mind only the school studies and disregards the rich fund of ideas that every child brings from his home must be a failure, because it only includes the weaker half of his experience. Home knowledge itself does not need to be made a concentrating center, but all its best materials must be drawn into the concentrating center of the school. But children bring many faulty, mistaken and even vicious ideas from their homes. It is well to know the actual situation. It is the work of the school at every step, while receiving to correct, enlarge or arrange the faulty or disordered knowledge brought into the school by children. We unconsciously use these materials and depend upon them for explaining new lessons, more constantly than

we are aware of. In fact if we were wise teachers we would consciously make a more frequent use of them and in order to render them more valuable take special pains to review, correct and arrange them. We would teach children to observe more closely and to remember better the things they daily see.

We shall appreciate better the value of home knowledge if we take note of the direct and constant dependence of the most important studies upon it. We usually think of history as something far away in New England, or France, or Egypt. History is mainly a study of the actions, customs, homes, and institutions of men in different countries. But what an abundance of similar facts and observations a child has gathered about home before he begins the study of history. From his infancy he has seen people of all sorts and conditions, rich and poor, ignorant and learned, honorable and mean. He has seen all sorts of human actions, learned to know their meaning and to pass judgment upon them. He has seen houses, churches, public buildings, trade and commerce, and a hundred human institutions. The child has been studying human actions and institutions in the concrete for a dozen years before he begins to read and recite history from books. Without the knowledge thus acquired out of school, society, government, and institutions would be worse than Greek. Geography as taught in the books would be totally foreign and strange but for the abundance of ideas the child has already picked up about hills, streams, roads, travel, storms, trees, animals, and people.

Natural science lessons must be based on a more careful study of things already seen about home, rocks and streams, flowers and plants, animals wild and tame. These with the forests, fields, brooks, seasons, tools and

inventions are the necessary object lessons in natural science which can serve daily to illustrate other lessons. How near then do the natural science topics geography, and history stand to the daily home life of a child! How intimate should be the relations which the school should establish between the parts of a child's experience! This is concentration in the broadest sense. A proper appreciation of this principle will save us from a number of common errors. Besides constantly associating home and school knowledge, we shall try to know the home and parents better, and the disposition and surroundings of each child. We shall be ready at any time to render home knowledge more clear and accurate, to correct faulty observation and opinion. While the children will be encouraged to illustrate lessons from their own experience, we shall fall into the excellent habit of explaining new and difficult points by a direct appeal to what the pupils have seen and understood. In short there will be a disposition to draw into the concentrating work of the school all the deeper but outside life-experiences which form so important an element in the character of every person, which however, teachers so often overlook. No other institution has such an opportunity or power to concentrate knowledge and experience as the school.

4. Another valuable educative result of apperception, cultivated in this manner, is a *consciousness of power* which springs from the ability to make a good use of our knowledge. The oftener children become aware that they have made a good use of acquired knowledge, the more they are encouraged. They see the treasure growing in their hands and feel conscious of their ability to use it. There is a mental exhilaration like that coming from abundant physical strength and health.

We may observe that it is one of the means for developing that *interest* which we have laid down as fundamental. It is always a joy to find old information useful in explaining new facts. When the principle of apperception is fully applied in teaching, the progress from one point to another is so gradual and clear that it gives pleasure. The clearness and understanding with which we receive knowledge adds greatly to our interest in it. On the contrary, when the principle of apperception is violated and new knowledge is only half understood and assimilated, there can be but little feeling of satisfaction.

Having seen the powerful aid rendered by apperception to the steady assimilation and concentration of knowledge we are prepared, in the next chapter, to discuss the *inductive process* as a natural trend of the mind in acquiring and classifying ideas and thus still further aiding concentration by a more scientific arrangement and association of our knowledge stores.

CHAPTER VI.

INDUCTION.

Induction, or the *concept-bearing process*, shows the tendency of our minds to advance from the inspection of particular objects and actions to the understanding of general notions or concepts. The study and analysis of this process casts us forthwith into the midst of psychology, and calls for a knowledge of that succession and network of mental activities discussed in all the psychologies; sensation, discrimination, perception, analysis and synthesis, comparison, judgment, generalization or concept, reasoning. An inquiry into these mental activities, which are among the most important in psychology, is necessary as a basis of induction and of general method.

But even the more profound study of psychology does not necessarily give insight into correct methods of teaching. Many great psychologists have had little or no interest in teaching. Even eminent specialists in electricity and chemistry have not often been those to draw the immediate practical benefit from their studies. The application of psychology to the work of instruction constitutes a distinct field of inquiry and experiment. The output of the best experimental thinking in this direction may be called pedagogy. The process of induction or concept-building leads the mind, as above indicated, through a series of different acts. We may first observe how far the mind is naturally inclined to follow

this process, and whether it is a mark of healthy mental action in children and in adults. Later we may examine more closely the successive stages in the process itself.

To get at the *natural process* it is well to observe first the action of a *child's* mind. By analyzing a simple case of a farmer's child we may trace the mental steps in forming a general notion. So long as it has seen no barn except that on its father's farm, the word *barn* means to it only that particular object. But when it discovers that one of the neighbors has a similar building called a barn, it learns to put these different objects under one head, and the general notion *barn* as a building for horses, cattle and feed gradually rises in the mind. Long before the child is six years old (school age) it may have seen enough of such barns for the general notion to be distinctly formed. By observing different objects, by comparing and grouping similar things together, it has formed a general notion in a regular process of induction and that without any help from teachers.

At two and three years of age or as soon as a child begins to recognize and name new objects (because of their resemblance to things previously seen) this tendency to concept-building is manifest. Another illustration: The child has seen the family horse several times till the word horse becomes associated with that animal. While out walking it sees another horse and pointing its finger says "horse." The memory of the first horse and the similarity calls forth the natural conclusion that this is a horse, though it may not be able to formulate the sentence. More horses are seen and compared till the word becomes the name of a whole class of animals. By a gradual process of observation, comparison and judg-

ment the word horse comes to stand for a large group of objects in nature.

A child's mind is naturally very *active* in detecting resemblances and in grouping similar objects together. It notices that there are certain people called women, others called men, that certain animals are called sheep, others cattle. One class of objects receives the name book, another stove, etc. The work of observing, comparing and classifying is a perpetual operation in the child's active moods. In this way, what may appear at first as an interminable confusion or blur of objects in nature begins to fall into groups and classes. It is the child's own way of bringing order out of the apparent chaos of his surroundings. All this process of classification is natural and nearly unconscious, and results in a better understanding and interpretation of the things around him.

Observe next the work of an educated *adult*, and how he increases and arranges his knowledge. If he is an incipient dry-goods merchant he learns by sight and touch to detect the quality of goods. He compares and classifies his experiences and becomes in time an expert in judging textile fabrics. On the other hand he becomes acquainted by personal contact with various customers and learns how to classify and judge them both as buyers and as debtors.

If a botanist finds a new plant he examines its stem, leaves, root, flower, seed and environment. While entering into these details he is also comparing it with familiar classes of plants. Finally he is not satisfied till he can definitely locate it in his previous system. With every new plant that he discovers he travels over the whole road from the individual particulars to the general

classes of his whole system. The merchant and the scientist follow out with painstaking care—and industry the same course which was involuntarily taken by the child, namely, observation of particulars, comparing and grouping into classes. The same habit of mind may be observed in all people who are growing knowledgewards and who possess any thoughtful instincts.

In acquiring knowledge along the line of induction, we are on the road to the solution of the *puzzle* that nature puts to every child. To every infant indeed the world is an enormous riddle or puzzle whose parts lie in fragments about him waiting the operation of his curious and inventive mind toward the reconstruction of the whole. Endless variety and complexity confronts us all in the beginning. There is indeed an order and classification of things in nature but it does not appear on the surface and for centuries men remained ignorant of the underlying harmony. Nature is full of valuable secrets, but they lie concealed from the careless eye. They are to be detected by prying deeper into individual facts, by putting a thing here and a thing there together, by pondering on the relationship of things to each other in their nature, appearance and cause. It is a remarkable fact that we not only increase knowledge best by analyzing, comparing and classifying objects, experiences and phenomena—even into old age—but that the deeper we penetrate into the individual qualities and inner nature of objects, the more we extend and classify our information, the simpler all the operations of nature become to our understanding. The surprising simplicity and unity of nature in her varied phenomena is one of the mature products of scientific study. The most scientific thinker then is only trying to reduce to a simple explanation the

same puzzle which confronted the infant in its cradle. The problem in the same and the method similar.

It is plain that the process of classifying objects and phenomena in nature and society is the beginning of scientific knowledge. A child begins to learn as soon as it notices the resemblances in things and arranges them into groups. The important thing for the teacher to determine is whether this inductive or concept-building tendency furnishes any solid ground upon which to base the work of instruction. Admitting that it is a natural process, common to both old and young in acquiring knowledge, perhaps it can be neglected because it will take care of itself. If it is self-active, needing no artificial stimulus, let it alone. On the contrary, if in a healthy pursuit of knowledge, it brings the varied mental powers into a natural sequence where they will strengthen and support one another, it should be studied and used by teachers. It would be very commonplace to say that each of the faculties or activities involved in the inductive process should be disciplined and strengthened by school studies. There is but little difference of opinion on this subject though some would lay more stress upon sense training, some on memory, some on reasoning. The ground for this general conviction is the notorious fact that with children every one of these acts is performed in a faulty and superficial manner. The observations of children are very careless and unreliable. Even adults are extremely negligent and inaccurate in their observations of natural objects, persons, and phenomena. But the mental powers brought to bear in observation are simple and elementary. The exercise of higher mental powers such as analysis, comparison, judgment, and reasoning is prone to be still more accidental and erro-

neous. Acknowledging then the necessity for training all these powers how can it best be done? Not by delegating to each study the cultivation of one kind or set of mental activities but by observing that the same general process underlies the acquisition of knowledge in each subject and that all the kinds of mental life are brought into action in nearly every study. In short the inductive process is a natural highway of human thought in every line of study bringing all the mental forces into an orderly, successive, healthful activity. We may yet discover that the inductive process not only gives the key to an interesting method of mastering different branches of knowledge, but in developing mental activity it brings the various mental powers into a strong natural sequence.

One of the great ends of intellectual culture is to transform this careless, unconscious inductive tendency in children into the painstaking and exact scrutiny of the student and later of the specialist.

Although the inductive process is a common highway of thought in all stages of intellectual growth from childhood to maturity, certain parts of the road are much more frequently traveled in childhood and still others in youth and maturity. It is the work of pedagogy to adapt its materials to these changing phases of soul life in children. In the analysis of the inductive and deductive processes we desire to come at the solution of this problem.

Considered as a whole, there is a simple phase of the inductive process which is best explained by the terms absorption and reflection. It appears in the study of simple as well as of complex objects and indicates clearly the fundamental rhythm of the mind in acquiring and elaborating its knowledge. This action of the mind is a

shuttle-like movement, a constant running back and forth between two extremes, *absorption* and *reflection*. We will test this statement upon examples. When we are in the mood for learning let some new object, a saw-mill, attract the attention. A quick general glance at the place and its surroundings tells us what it is. Now trace the operation of the mill as it draws up the logs singly from the rafts lying on the margin of the river and converts them into lumber. You observe first how the logs are carried up an inclined slide by means of an endless chain with hooks, into the mill. You examine this first piece of machinery and notice its mode of action. As the logs enter the upper story of the mill, they are thrown by heavy levers to either side and roll down towards the saws. Here is another piece of machinery in its proper place. Having been stripped of the loose pieces of bark, the logs are grasped by another set of iron hands, lifted firmly to the carriage and passed to the circular or band-saw which takes off the side slabs and squares them for the gang-saw. The squared logs are then carried along over rollers and collected before the gang-saws. From two to four of them are clasped firmly together and then forced up against the teeth of the parallel group of saws, issuing from them as a batch of lumber. The boards are then passed on to a set of men at small circular saws by whom they are sorted and the edges trimmed, while still others with trucks carry them to the yard for stacking.

Take note of the operation of the mind as it passes from one part of the machinery to another. Each part is first examined by itself to get its construction and method. Then its relation to what precedes and what follows is noted. Finally in review you survey the whole

process in its successive stages and understand each part and its relation to the whole and to the purpose of the mill. We might call this an analysis and synthesis of the process of making lumber, or in other words absorption and reflection in an elementary form. In the observation of such a complex piece of machinery as a large mill the mind swings back and forth many times between absorption in the study of parts and reflection upon their relation to each other.

Having examined the mill in detail and grasped its parts as a connected whole, the next step is to observe its relation to the river, to the rafts and rafting-boats, and further back to the pineries and logging-camps up the river. (Northern Minnesota and Wisconsin.) The occupations and sights along the Upper Mississippi and its head-waters, the pineries, and even the spring floods are intimately connected causally with the saw mills and lumber yards lower down.

Or going in the opposite direction from the saw mill, we follow the lumber till it is used in the various forms of construction. Some of it enters the planing-mills and is converted into moldings, finishing lumber, sashes, blinds, etc. In all forms it is loaded upon the cars, and shipped westward to be used in the construction of houses and bridges.

Before we get through with the line of thought engendered by observing the saw mill, we have canvassed the whole lumber industry from the pineries to the plans of architects and builders in the actual work of construction. Not only has there been this progress of the mind from one object or machine to another of a *series* connected by cause and effect, but there has been also a constant tendency to pass from the individual machines of

which the series is composed to the classes of which these objects are typical. A circular-saw or a gang-saw is each typical of a class of saws. The same is true of each part of the machinery as well as of the saw mill or planing mill considered as a whole. Each of these objects whether simple or complex suggests others similar which we have observed or seen represented in pictures. Each part of the machinery in turn becomes the center of a set of comparisons leading from the concrete object in question to the general notion of the class to which it belongs.

In all these cases we become absorbed in one thing for a while only to recover ourselves and to reflect upon the thing in its wider relations, either tracing out connexions of cause and effect as in a series of machines or passing from the single example to the class of which it is typical. Absorption and reflection! The mind swings back and forth like a pendulum between these two operations. Herbart who closely defined this process, called it the *mental act of breathing*, because of the constancy of its movement. As regularly as the air is drawn into the lungs and again expelled, so regularly does the mind lose itself in its absorption with objects only to recover itself and reflect upon them.

In the inspection of a large printing press in one of our newspaper publishing houses we meet with a similar experience. The attention becomes centered upon the press for a close analysis and synthesis of its parts. The cogs, wheels, rollers, inking-plate, the chases for the type, the application of the power, the springs and levers, each part receives a close inspection, and the secret of its connection with other parts is sought for. There is a vigorous effort not only to understand each part but also the

connexion of the whole. The shuttle-like movement of the mind back and forth between the parts, absorbed for a moment, reflecting for a moment, continues until the complex mechanism is understood. When this process has been satisfactorily completed we are ready to turn our minds again to the other objects and rooms of the printing establishment. The work of the compositors, setting up different kinds of type, the proof-reading, the editorial work, the reporters all come in for a share of attention. The reporters lead us to the great world outside whose happenings are brought here for publication. On the other hand, following the distribution of papers as they issue from the press, we think of news-boys, news-stands, mail-service, railroads and post-offices. But the inspection of a printing press also leads the thoughts in other directions and suggests other presses, great and small, in other times and places, other printing establishments, until the whole business of printing and publishing books and papers springs into the thought.

If we desire to understand clearly the business of publishing a newspaper, we must enter into an observation of the parts of the process from the collection of its news to its distribution by the mails and carriers. Besides noting these parts we must observe their causal connexion with each other and the rôle that each plays in the economy of the whole. The causal series thus clearly outlined produces insight into an occupation while every typical machine or appliance is one of a cross series intercepting the original series. The acquisition and assimilation of knowledge in different subjects will be found to exhibit the mental states of absorption and reflexion as just illustrated. Observe the manner in which we study a poem. It is first read and interpreted sentence by sen-

tence, glancing from verse to verse to get the connections. When the whole piece has been read and understood in its parts and connections, the suggested lines of thought are taken up and followed out in their wider applications. Take for an example the "Burial of Moses" and in the proper analysis and study of the poem such a process of absorption and reflexion is observable. In pursuing the biography of John Quincy Adams or of Alexander Hamilton the facts of personal experience and action first absorb the attention from step to step in the study of his life. But reflexion on the bearings of these personal events upon contemporaries and upon public affairs is noticed all along. The same mental process is observed in studying a battle in history, a sentence in grammar, a squirrel in natural history, or a picture in art.

The effect of such mental absorption and reflexion is to build up concepts. Series of causally related parts are also formed but each series in the end becomes a more complete complex concept, that is, a representative of many similiar series. The inspection of one printing establishment suggests others which are brought into comparison till the general notion *publishing house* is more clearly conceived. The same is true in the lumber trade. The concept lumber business is not confined to Minneapolis or Chicago but is common to the great lake region, Maine, Washington, Norway and other countries. Concepts become more varied and complex with the advance of studies and there is scarcely anything we learn by observation or reflexion that does not ultimately illustrate and build up our concepts. The observation of even the miscellaneous objects in a large city leads to a variety of concepts and in the end by comparison to the general notion *city*.

How strong the concept-creating tendency of all experience and thought is, can be seen in the words of language. The processes of thought become petrified in language. All progress in knowledge and acquisition of new ideas is reflected in language by an increase of words. But an examination of words in common use will show that they are nearly all the names of concepts. Proper names are the principal exception. Every common noun, verb, adjective, adverb, and preposition is the name of a concept. To understand these concepts there must be somewhere a progress from the individual to the abstract, an induction from particulars to a general concept. Abstract or general notions cannot be acquired at first hand without specific illustrations. Even where the deductive process is supposedly employed a closer examination will uncover the concrete or individual illustrations in the background and until these are reached the concept has no clear meaning. The concrete examples whether introduced sooner or later by way of explanation are the real basis of the understanding of the concept. It is customary to invert the inductive process and to drive it stern forwards through grammar, geography, and other studies. Take for example the word *boomerang* as it comes up in a geography or reading lesson. Webster's dictionary, which is recommended to children as a first resort in such difficulties, calls it "A remarkable missile weapon used by the natives of Australia." This gives a faint notion by using the familiar word *weapon*. The picture accompanying the word in the dictionary gives a more accurate idea because nearer the concrete. The best possible explanation would be a real boomerang thrown by a native South-Sea islander. In the absence of these a picture and a vivid

description are the best means at our disposal. The common mistake is in learning and reciting the definition while neglecting the concrete basis. By way of further illustration, try to explain to children who have never heard of them before the egg-plant, palm-tree, cactus, etc.

It would be of interest to inquire into the process of concept-building in each of the school studies, where it appears under quite varying forms. The natural sciences are perhaps the best examples of concept-building from concrete materials, advancing regularly through a series of concepts from the individuals and species to the most general classes of plants, animals, etc. In chemistry and physics the laws and general principles are based on experiments and processes observable by the senses. Grammar and language, when studied as a science, advance from concept to concept through etymology and syntax. In geography and history the concepts are less definite and more difficult to formulate, and yet there are certain great typical ideas which are to be developed and illustrated in each of these studies, as, for example, the law of cause and effect and the human virtues in history, and the forms of relief, the kinds of climate and their causes, the occupations of men and their relation to each other, in geography. The fundamental truths and relations of arithmetic must be developed from objects. Reading, spelling, and writing are arts not sciences, and are more concerned with skill in execution than with the acquisition of a body of scientific truths. And yet certain general truths are emphasized and applied in these studies.

Having thus examined into the general nature of the inductive process and the extent of its application to school studies and to other forms of acquiring knowledge,

we are led to a closer practical discussion of each of the two chief stages of induction, first *observation or intuition*, that is, the direct perception through the senses or through consciousness of the realities of the external world and of the mind. Second, association of ideas with a view to generalizing and *forming concepts*. Intuition means *object-lessons* in a broad sense. Object lessons in this liberal sense point to the direct exercise of the senses and intuitions in the acquisition of experience of all sorts. They include the objects, persons and events that we see around us and our own experiences in ordinary life, the grass, plants, trees and soils, the animals, wild and tame, with their structure, habits and uses; the rocks, woods, hills, streams, seasons, clouds, heat and cold. There is also the observation of devices and inventions; tools, machinery and their workings, the different raw and manufactured products with their ways of growth and transformation. Besides these are the various kinds and dispositions of men, different classes and races of people, with great variety of character, occupation and education. Their actions, modes of dress and customs are of much interest. But we have many other primary and indispensable lessons to learn from the playground, the street, from home and church, from city and country, from travel and sight seeing, from holidays and work days, from sickness and healthful excursions. Even a child's own tempers, faults and successes are of the greatest value to himself and to the teacher in a proper self-understanding and mastery. By object lessons, therefore, we mean all that a child becomes conscious of through the direct action of his senses and of his mind upon external nature or inner experience. It is desired that a child's knowledge in all direct experience be sim-

ple, clear and according to the facts. — All words that he uses become only signs of the realities of his experience. Every word stands for a potent thought in his own life history. Of course object lessons in this rich and real sense can not be confined to such few objects—birds, leaves, models, and straws—as can be brought into a school room. All the world, especially the outside world, becomes

“A complex Chinese toy
Fashioned for a barefoot boy.”

Many of the most interesting objects and phenomena in nature and of man's construction can not be observed in the school room at all. For instance, the river, the bridge, the forest, the flight of birds, the sunrise, the storm, the stars, etc. Still they must know these very things and know how to use them better in constructing the mind's treasures than they are wont to do. In reading, grammar, geography, arithmetic and nature study we desire to ground school discussions daily upon the clear facts of experience, of personal observation. We need to clear up all confused and faulty perceptions and stimulate children to make their future observations more reliable.

We have already seen the importance of object lessons in this full and real sense to *interest*. Interest in every study is awakened and constantly reinforced by an appeal, not to books, but to life. Much of the dull work in arithmetic, geography, and other studies is due to the neglect of these real, illustrative materials.

Of the six great sources of interest (Herbart) three, the *empirical*, the *esthetic*, and the *sympathetic*, deal entirely with concrete objects or with individuals, while even the *speculative* and *social* interests are often based

directly upon particular persons or phenomena. In addition to this it may be said that the interests of children are overwhelmingly with the concrete and imaginative phases of every subject and only secondarily with general truths and laws. The latter are of greater concern to older children and adults. Object lessons therefore contain a life-giving element that should enter into every subject of study.

Nor should these interesting illustrative object lessons be limited to the lower grades. They contain the combustible material upon which an abiding interest in any subject is to be kindled. There are indeed other and perhaps higher sources of interest but they are largely dependent upon these original springs that flow from the concrete beginnings.

In the second place, object lessons supply a *stock of primary ideas* which form the foundation of all later progress in knowledge. This is not a question of interest merely, but of *understanding*, of capacity to get at the meaning of an idea. Concepts are not the raw materials with which the mind works, but they are elaborated out of the raw products furnished by the senses and other forms of intuition. As cloth is manufactured out of the raw cotton and wool produced on the farm or in southern fields, so concepts are a manufactured article, into whose texture materials previously gathered enter. Concepts do not grow up directly from the soil of the mind any more than ready-made clothing grows on bushes or on the backs of the wearers. Concepts must be made out of stuff that is already in the mind, as woolen blankets are spun and woven out of fleeces. Our present contention is that the mind shall be filled up with the best quality of raw stuff, otherwise there will be defect and deficiency

in its later products. The stuff out of which concepts are built is drawn from the varied experiences of life. On account of this intimate relation between the realities of life and school studies they cannot be separated. Every branch, especially in elementary studies, must be treated concretely and be built up out of sense materials. Every study has its concrete side, its illustrative materials, its colors of individual things taken from life. Every study has likewise its more general scientific truths and classifications. The prime mistake in nearly all teaching and in the text-book method is in supposing that the great truths are accessible in some other way than through the concrete materials that lie properly at the entrance. The text-books are full of the abstractions and general formulæ of the sciences, but they can, in the very nature of the case, deal only in a meagre way with the individual objects and facts upon which knowledge in different subjects is based. This necessary defect in a text book method must be made good by excursions, by personal observation, by a constant reference of lessons to daily experience outside of school, by more direct study of our surroundings, by the teacher perfecting himself in this kind of knowledge and in its skillful use. •

The discussion of the concept and of the inductive process has shown that concepts cannot be found at first hand. There must be observation of different objects, comparison and grouping into a class. A person who has never seen an elephant nor a picture of one can form no adequate notion of elephants in general. We can by no shift dispense with the illustrations. The more the memory is filled with vivid pictures of real things, the more easy and rapid will be the progress to general truths. Not only are general notions of classes of objects in nature or of

personal actions built up out of particulars but the general laws and principles of nature and of human society must be observed in real life to be understood. We should have no faith in *electricity* if it were simply a scientific theory, if it had not demonstrated its power through material objects. The idea of *cohesion* would never have been dreamed of, if it had not become necessary to explain certain physical facts. The spherical form of the earth was not accepted by many even learned men until sailors with ships had gone around it. Political ideas of popular government which a few centuries ago were regarded as purely utopian are now accepted as facts because they have become matters of common observation. The *circulation of the blood* remained a secret for many centuries because of the difficulties of bringing it home to the knowledge of the senses. These examples will show how difficult it is to go beyond the reach of sense experience. Even those philosophers who have tried to construct theories without the safe foundation of facts have labored for naught. The more our thought is checked and guided by nature's realities the less danger of inflation with pretended knowledge. Bacon found that in this tendency to theorize loosely upon a slender basis of facts was the fundamental weakness of ancient philosophy. Nature if observed will reiterate her truths till they become convincing verities, while the study of words and books alone produces a *quasi-knowledge* which often mistakes the symbol for the thing.

Having this thought in mind, Comenius, more than two and a half centuries ago, said, 'It is certain that there is nothing in the understanding which has not been previously in the senses, and consequently to exercise the senses carefully in discriminating the differences of nat-

ural objects is to lay the foundation of all wisdom, all eloquence, and of all good and prudent action. The right instruction of youth does not consist in cramming them with a mass of words, phrases, sentences, and opinions collected from authors. In this way the youth are taught, like Æsop's crow in the fable, to adorn themselves with strange feathers. Why should we not, instead of dead books, open the living book of nature? Not the shadows of things, but the things themselves, which make an impression upon the senses and imagination, are to be brought before the youth."

There has always been a strong tendency in the schools to teach words, definitions and rules without a sufficient knowledge of the objects and experiences of life that put meaning into these abstractions. The result is that all the prominent educational reformers have pointedly condemned the practice of learning words, names, etc., without a knowledge of the things signified. The difference is like that between learning the names of a list of persons at a reception, and being present to enter into acquaintance and conversation with the guests. The oft-quoted dictum of Kant is a laconic summary of this argument. "General notions (concepts) without sense-percepts are empty." The general definition of composite flowers means little or nothing to a child, but after a familiar acquaintance with the sunflower, dandelion, thistle, etc., such a general statement has a clear meaning. Concepts without the content derived from objects are like a frame without a picture, or a cistern without water. The table is spread and the dishes placed but no refreshments are supplied.

Having completed the discussion of *intuition*, including object lessons, that is, the preparatory step to the in-

ductive process, we reach the second, *reflection* and *survey*. We are seeking for a general term that covers the several steps, in the latter part of the inductive process. It includes comparison, classification and abstraction. It may be discussed from the standpoint of "association of ideas," and contributes directly to concentration.

We have in mind chiefly that thoughtful habit which is not satisfied with simply acquiring a new fact or set of ideas, but is impelled to trace them out along their various connexions. We have to do now not with the acquisition but with the *elaboration* and *assimilation* of knowledge. The *acquisition* of knowledge in the ordinary sense is one thing, its *elaboration* in a full sense sets up a standard of progress which will put life into all school work and reach far beyond it, and in fact is limited only by the individual capacity for thought.

In school, in reading and study we have been largely engaged in acquiring knowledge on the principle that "knowledge is power." But no practical man needs to be told that much so-called school knowledge is not power. Facts which have been simply stored in the memory are often of little ready use. Like wheat in the bin, which must first pass through the mill and change its entire form before it will perform its function. Facts, in order to become the personal property of the owner, must be worked over, sifted, sorted, classified and connected. The process of elaborating and assimilating knowledge is so important that it requires more time and pains than the first labor of acquisition. Philosophers will admit this at once, but it is hard for us to break loose from the traditions of the schoolmasters. The mind is not in all respects like a *lumber-yard*. It is, to be sure, a place for storing up knowledge, just as the yard is a deposit for

lumber. But there the analogy ceases and the mind begins to resemble more the contractor and builder. There is planing, sawing and hammering, the materials collected are prepared, fitted and mortised together, and a building fit for use begins to rise. Knowledge also is for use and not primarily for storage. That simple acquisition and quantity of knowledge are not enough is illustrated by the analogy of an army. Numbers do not make an army but a rabble. A general first enlists raw recruits, drills and trains them through a long period and finally combines them into an effective army. Many of our ideas when first received are like disorderly raw recruits. They need to be disciplined into proper action and to ready obedience.

In connexion with assimilation the analogy between the *stomach* and the mind is of still greater interest. The food received into the stomach is taken up by the organs of digestion, assimilated and converted into blood. The process however takes its course without our conscious effort or co-operation. Knowledge likewise enters the mind, but how far will assimilation go on without conscious effort? If kept in a healthy state the organs of digestion are self active. Not so the mind. Ideas entering the mind are not so easily assimilated as the food materials that enter the stomach. A cow chews her cud once but the ideas that enter our minds may be drawn from their receptacle in the memory and worked over again and again. Ideas have to be put side by side, separated, grouped, and arranged into connected series. There is, no doubt, some tendency in the mind toward involuntary assimilation, but it greatly needs culture and training. Many people never reach the *thinking* stage, never learn to survey and reflect. The tendency of the

mind to work over and digest knowledge should receive ample culture in the schools. There is a mental inertia produced by pure memory exercise that is unfavorable to reflection. It requires an extra exertion to arrange and organize facts even after they are acquired. But when the habit of reflection has been inaugurated it adds much interest and value to all mental acquisitions.

There are also well-established principles which guide the mind in elaborating its facts. The laws of the association of ideas indicate clearly the natural trends of mental elaboration. The association of things because of contiguity in time and place is the simplest mode. The classification of objects or activities on the basis of resemblance is the second form and that upon which the inductive process is principally founded. In the third case objects and series are easily retained in memory when the relation of cause and effect is perceived between them. These natural highways of association, especially the second and third, should be frequently traveled in linking the facts of school study with each other. Indeed the outcome of a rational survey of an object or fact in its different relations is an association of ideas which is one of the best results of study. Such connexions of resemblance and difference or of cause and effect are abundant and interesting in the natural sciences and physical geography, also in history and language.

The final stage of induction is the formulation of the general truths, the concepts, principles and laws which constitute the science of any branch of knowledge. These truths should be well formulated in clear and expressive language and mastered in this form. Moreover the results reached, when reduced to the strict scientific form

are the same in the inductive methods as in the deductive or common text-book method. Not that the effect on the mind of the learner is the same but the body of truth is unaltered. The general truths of every subject can be easily found well arranged in text-books. But we are more anxious to know how the youth may best approach and appreciate these truths than simply to see them stored in the mind in a well-classified form.

A rich man in leaving a fortune to his son would more than double the value of the inheritance if he could teach him properly to appreciate wealth and form in him the disposition and ability to use it wisely.

The method of reaching scientific knowledge, through the inductive process, that is, by the collection and comparison of data with a view to positive knowledge, will give greater meaning to the results. Interest is awakened and self-activity exercised at every step in the progress toward general truths. By the reflective habit these truths will be seen in their origin and causal connexion, and the line of similarity, contrast, causal relation, analogy and coincidence will be thoughtfully traced.

Possibly the progress toward formulated knowledge will be less rapid by induction, but it will be real progress with no backward steps. It may well be doubted whether, with average minds, real scientific knowledge is attainable except by a strong admixture of inductive processes.

CHAPTER VII.

THE WILL.

We have now completed the discussion of the concept bearing or inductive process in learning, and apperception, and find that they both tend to the unifying of knowledge, and to the awakening of interest.

It remains to be seen how the *will* may be brought into activity and placed in command of the resources of the mind.

The *will* is that power of the mind which chooses, decides and controls action.

According to psychology there are three distinct activities of the mind, *knowing*, *feeling*, and *willing*. These three powers are related to one another, and yet the will should become the *monarch of the mind*. It is expected that all the other activities of the mind will be brought into subjection to the will. For strong *character* resides in the will. Strength of character depends entirely upon the mastery which the will has acquired over the life, and *the formation of character*, as shown in a strong moral will, is the highest aim of education.

The *great problem* for us to solve is: 1. How far can teaching stimulate and develop such a will?

There is an apparant contradiction in saying that the *will* is the monarch of the mind, the power which must control and subject all the other powers, and yet that it can be trained, educated, moulded, and chiefly too by a proper cultivation of the other powers, *feeling* and *know-*

ing. Knowledge and feeling, while they are subject to the will, still constitute its strength, just as the soldiers and officers of an army are subject to a commander and yet make him powerful.

We shall first notice the dependence of the will upon the *knowing* faculty. It is an old saying "that knowledge is power." But it is power only as a strong will is able to convert knowledge into action. Before the will can *decide* to do any given act it must see its way clearly. It must at least believe in the possibility. *In trying to get across a stream*, for example, if one can not swim and there is no bridge nor boat nor means of making one, the will can not act. It is helpless. The will must be shown the way to its aims or they are impossible. The more clear and distinct our knowledge, the better we can lay our plans and *will* to carry them out. It would be impossible for one of us *to will* to run a steam engine from Chicago to St. Paul to-day. We don't know how, and we should not be permitted to try. In every field of action we must have knowledge, and clear knowledge before the will can act to good advantage. It is only knowledge, or at least faith in the possibility of accomplishing an undertaking, that opens the way to will. Much successful *experience* in any line of work brings increasing confidence and the will is greatly strengthened, because one knows that certain actions are possible. The simple acquisition of facts therefore, the increase of knowledge, so long as it is well digested, makes it possible for the will to act with greater energy in various directions. The more clear this knowledge is, the more thoroughly it is cemented together in its parts and subject to control, the greater and more effective can be the will action. All the knowledge we may acquire can be

used by the will in planning and carrying out its purposes. Knowledge therefore, derived from all sources, is a *means* used by the will, and increases the possibilities of its action.

But, secondly, there are found still more immediate means of stimulating and strengthening the will, namely, in the *feelings*. The feelings are more closely related to will than knowledge, at least in the sense of cause and effect. There is a gradual transition from the feelings up to will, as follows: Interest in an object, inclination, desire and purpose or will to secure it. We might say that will is only the final link in the chain and the feelings and desires lead up to and produce the act of willing. Even will itself has been called a feeling by some psychologists and classed with the feelings. But the thing in which we are now most concerned is how to reach and strengthen the will through the feelings. Some of the feelings which powerfully influence the will are desire of approbation, ambition, love of knowledge, appreciation of the beautiful and the good; or on the other side, rivalry, envy, hate and ill-will. Now it is clear that a cultivation of the feelings and emotions is possible which may strongly influence the purposes and decisions of the will, either in the right or wrong direction. It is just at this point that education is capable of a vigorous influence in moulding the character of a child. The cultivation of the *six interests* already mentioned is little else than a cultivation of the great classes of feeling, for interest always contains a strong element of feeling. It is certain in any case that a child's, and eventually a man's will, is to be guided largely by his feelings. Whether any *care is taken* in education or not, feeling, good or bad, will guide the will. Most people, as we

know, are too much influenced by their feelings. This is apparent in the adage, "Think twice before you speak." Feelings of malice and ill-will, of revenge and envy, of dislike and jealousy, get the control in many lives, because they have been permitted to grow and nothing better has been put in their place. The teacher by *selecting the proper materials* of study is able to cultivate and strengthen such feelings as sympathy and kindness toward others, appreciation of brave unselfish acts in others, the feeling of generosity, charity and a forgiving spirit, a love for honesty and uprightness, a desire and ambition for knowledge in many directions. On the other hand the teacher may gently instill a *dislike* for cowardice, meanness, selfishness, laziness and envy, and bring the child to master and control these evil dispositions. Not only is it possible to cultivate these feelings which we may summarize as the love of the virtues and develop a dislike and turning away from vices, but this work of cultivating the feelings may be carried on so systematically that great *habits* of feeling are formed, and these habits become the very strongholds of character. They are the forces acting upon the will and guiding its choice.

It is *freedom of the will* to chose the best, that we are after. We desire to limit the choice of the will if possible to good things. We desire to make the character so strong and so noble and consistent in its desires that it will not be strongly tempted by evil. The will in the end, while it controls all the life and action, is itself under the guidance of those *habits* of thought and feeling that have been gradually formed. Sully says, "Thus it is feeling that ultimately supplies the stimulus or force to volition and intellect which guides or illumines it."

A study of the will in its relation to knowledge and feeling reveals that the training and development of the will depend upon *exercise* and upon *instruction*. There are two ways of exercising will power, first, by requiring it to obey authority promptly and control the body and the mind at the direction of another. The discipline of a school may exert a strong influence upon pupils in teaching them concentration and will power under the direction of another. Especially is this true in lower grades. Children in the first grade have but little power or habit of concentrating the attention. The will of the teacher combined with her tact must aid in developing the energies of the will in these little ones. The primary value of quick obedience in school, of exact discipline in marching, rising, etc., is twofold. It secures the necessary orderliness and it trains the will. Even in higher and normal schools such a perfect discipline has a great value in training to alertness and quickness of apprehension associated with action.

Secondly, by the training of the mind to freedom of action, to *self activity*, to independence. As soon as children begin to develop the power of independent action their self activity should be encouraged. Even in the lowest grades the beginnings may be made. An *aim* may be set before them which they are to reach by their own efforts. For example, let a class in the first reader be asked to make a list of all the words in the last two lessons containing *th*, or *oi*, or some other combination. *Activity* rather than repose is the nature of children, and even in the kindergarten this activity is directed to the attainment of definite ends. With number work in the first grade the objects should be handled by the children, the letters made, rude drawings

sketched, so as to give play to their active powers as well as to lead them on to confidence in doing, to an increase of self activity. As children grow older, the problems set before them, the aims held out, should be more difficult. Of course they should be of *interest* to the child so that it will have an impulse and desire of its own to reach them. There is nothing so valuable as setting up *definite aims* before children and then supplying them with incentives to reach them through their own efforts. It has been often supposed that the only way to do this is to use *reference books*, to study up the lesson or some topics of it outside of the regular order. But self activity is by no means limited to such outside work. A child's self activity may be often aroused by the manner of studying a simple lesson from a text book. When a reading or geography lesson is so studied that the pupil thoroughly sifts the piece, hunts down the thought till he is certain of its meaning, when all the previous knowledge the pupil can command is brought to bear upon this, to throw light upon it, when the dictionary and any other books familiar to the child are studied for the sake of reference and explanation, self activity is developed. Whenever the disposition can be stimulated to look at a fact or statement from *more than one standpoint*, to *criticise* it even, to see how true it is, or if there are exceptions, self activity is cultivated.

The pursuit of definite *aims* always calls out the will and their satisfactory attainment strengthens one's confidence in his ability to succeed. Every step should be toward a clearly seen aim. At least this is our ideal in working with children. They should not be led on blindly from one point to another, but try to reach definite results.

There is a gradual transition in the course of a child's schooling from training of the will under guidance to its independent exercise. Throughout the school course there must be much obedience and will effort under the guidance of one in authority. But there should be a gradual increase of self-activity and self-determination. When the pupil leaves school he should be prepared to launch out and pursue his own aims with success.

Will effort, however, to be valuable must have its roots in those moral convictions which it is the chief aim of the school to foster and strengthen. We have attempted to show in the preceding chapters how the central subject matter of the school could be chosen and the other studies concentrated about it with a view to accomplishing this result. In concluding our discussion of general principles of education, and in summing up the results, basing our reasoning upon psychology, we are always forced to the conclusion that education aims at the *will*, and more particularly at the will as influenced and guided by moral ideas. This is the same as saying that we have completed the circle and come round to our starting point, that *moral character is the chief aim of education*.

Teachers who are interested in this phase of pedagogy will do well to study the *science of ethics*, not that it will much aid them directly in school work. It will at least give them a more comprehensive and definite notion of the field of morals and perhaps indicate more clearly where the *materials* of moral education are to be sought and the leading ideas to be emphasized.

Herbart projected a system of ethics, based on psychology, with the intention of classifying the chief moral notions and of showing their relation to each other. He also developed a theory of the *origin* of moral ideas and

their best means of cultivation, and then based his system of pedagogy upon it.

The chief classes of ethical ideas of Herbart are briefly explained as follows:

1. *Good will*. It is manifested in the sympathy we feel for the sorrow or joy of another person. It is illustrated by the example of Sidney and Howard already cited.

2. *Legal right*. It serves to avoid strife by some agreement or established rule; *e. g.*, the government of the United States fixes the law for pre-empting land and for homestead claims so that no two persons can lay claim to the same piece of land.

3. *Justice*, as expressed by reward or punishment. When a person purposely does an injury to another all men unite in the judgment, "He must be punished." Likewise if a kind act is done to anyone we insist upon a return of gratitude at least.

4. *Perfection of will*. This implies that the will is strong enough to resist all opposition. David's will to go out and meet Goliath was perfect. A boy desires to get his lesson but indolence and the love of play are too strong for his will.

There is nothing which goes so far to make up the character of the hero as strength of will which yields to no difficulties.

5. *Inner freedom*. This is the obedience of the will to its *highest* moral incentive. Ability to set the will free from all selfish or wrong desires and yield implicit obedience to moral ideas. This of course depends upon the cultivation of the other ideas and their proper subordination, one to another.

The five moral ideas just given along which strength of moral character are of some interest to the teacher as a arrangement of morals, but they are of no direct teaching. They are the most abstract and classes of moral ideas and are of no interest whatever to children.

In morals the only thing that interests children is *moral action*. Whether it be in actual life or in a story or history the child is aroused by a deed of kindness or courage. But all talk of kindness or goodness in general, disconnected from particular persons and actions is dry and uninteresting. This gives us *the key to the child's mind in morals*. Not moralizing, not preaching, not lecturing, not reproof, can ever be the *original source* of moral ideas with the young, but the *actions* of people they see and of those about whom they read or hear. Moral judgments and feelings spring up originally only in connexion with human action in the concrete. If we propose then to *adapt moral teaching* to youthful minds, we must make use of concrete materials, observations of people taken from what the children have seen, stories and biographies of historical characters. A story of a man's life is concrete because it brings out his particular motives and actions. This is the field in which instruction has its conquests to make over youthful minds.

We will gather up the fruits of our discussion in the preceding chapters. Having fixed the chief aim in the effort to influence and strengthen moral character, we find *concentration* to be the central principle in which all others unite. It is the focusing of life and school experiences in the unity of the personality. The worth and choice of studies is determined by this. Interest unites

knowledge, feeling and will. The culture epochs supply the nucleus of materials for moral educative purposes. Apperception assimilates new ideas by bringing each into the bond of its kindred and friends, spinning threads of connexion in every direction. The inductive process collects, classifies and organizes knowledge, everywhere tending toward unity.

CHAPTER VIII.

THE FORMAL STEPS.

Our closing chapter will be an attempt to show the application of the principles thus far discussed to the daily work of teaching, more particularly to the child's work of study and recitation and the teacher's supervision of the processes of learning and thinking.*

Lesson Unities.—It is evident that in this kind of teaching no single recitation can be viewed apart from the series of lessons to which it belongs. The subject-matter of any study should be first selected so as to be adapted to the age, spirit, and previous knowledge of children, and then it should be arranged into a succession of topics or unities each of which may be treated first separately, and then in its relation to the others. One of these methodical unities may be completed in a single recitation or it may spread over a series of lessons.

Steps in Teaching a Lesson.—On the basis of the psychological principles already treated, the process of teaching a new topic leads through a series of steps. The Herbartian school of pedagogy in Germany has developed a plan of recitation work based upon these steps, and has applied them successfully to the teaching of common-school studies. The two main stages on the road to acquisition of knowledge have been already indicated:

*NOTE.—The following pages were first published in a pamphlet, "How to Conduct the Recitation," by the author. Published by E. L. Kellogg & Co., New York.

1. As observation and scrutiny of individual things; 2. As the association and comparison of objects or ideas with a view to arrangement into classes or for the purpose of generalizing and formulating results.

First Stage: Presentation.—The first stage may be broken into two smaller half-day journeys. Before setting out on a journey it is well to survey the road and glance at a guide-book. Before beginning a new subject it is well to recall familiar ideas bearing upon it, to refresh our minds. This is a *preparatory* study, a making ready for the lesson. The second part is the actual presentation of the new facts, the familiarizing the mind with the new subject.

The subject-matter is now at hand, and the first stage of teaching the lesson is complete. But this newly acquired information has not yet settled to its proper place in the mind; it is not properly associated with previous knowledge.

Second Stage: Elaboration.—This elaboration of newly presented ideas and facts leads us through a series of three additional steps, which thus complete the process of acquisition: 1. The new object is compared with similar things already in the mind. In this way it finds its fitting companionship. 2. Every new object presented to the mind and then compared with others gives rise to new conclusions. The clear statement of this general result or truth focuses the main idea of the lesson. 3. This general truth may now be exemplified in new cases and applied to new circumstances.

Briefly stated the steps are as follows: 1. Preparation; 2. Presentation; 3. Association and comparison; 4. Generalization; 5. Practical application.

It is to be remembered that a subject to be treated in this manner must contain a unity of thought; that it must centre in an object which is typical of a class, so as to serve as a basis of comparison and generalization.

Analogy of the Farmer.—These steps may be fairly illustrated in their general outlines by an analogy taken from the work of a farmer. 1. The soil is ploughed, harrowed, and made ready for the seed. 2. The grain is sowed upon the ready soil and raked in. 3. The growing grain is cultivated and the weeds destroyed. 4. The harvest is brought in. 5. The grain is used for practical purposes of food.

The analogy is so complete that it scarcely calls for a commentary. The preparation is the preparing of the soil of the mind for the seed-corn of instruction. The presentation is sowing the seed upon this prepared soil of the mind. The third stage is the cultivation of the growing crop, the working over of the knowledge just acquired by means of comparison. The fourth step is the harvest time, the drawing out of the general truth or law involved in the lesson. Finally, the particular uses to which the harvest grain is put, the application of acquired knowledge to the practical uses of life.

No Royal Road in Teaching.—The five steps just outlined are based, as we believe, on general principles which make them applicable to almost every subject of study. But the manner of applying them to different studies varies greatly. The ability to apply them successfully to geography would not qualify for equal success in arithmetic or botany. The teacher must first be a proficient in the study which he would desire to teach in this way. Both the concrete facts and the general truths of the subject should be familiar and logically

arranged in his mind. To put it in a mild form, the teacher must have a thorough knowledge of his subject, and must have this knowledge well digested for teaching purposes; *For teaching purposes!* That is, that we have a knowledge of those psychological principles which we first outlined as a basis of the five steps, viz., observation of concrete things, apperception, comparison and association, generalization and the awakening of interest, self-activity, and will power by these means. Now it is evident that no plan based on these principles will furnish a *royal road* to success in teaching. Success along this line depends upon industry, adaptability, and continuous practice. It will be an up-hill road for some time, and it is only gradually that one will acquire that mastery of the subject and that tact in the manipulation of a somewhat complex machinery that come only through toil and pains.

Dull Machine Work.—It does not require a prophet to see that the five steps in careless hands will degenerate into a mechanical routine. It might be even worse than text-book lore, for a good text-book is always better than a poor teacher. It is not intended that this plan and these principles shall make a slave of the teacher, but that by a hard-earned mastery of their details, and by a successful application of them to the concrete materials of study, he gradually works his way out into the clear daylight of conscious power. In this way the teacher becomes a skilled architect, with clear ideas of the strength and resistance of materials.

EXAMPLES OF THE FORMAL STEPS.

Three simple illustrations of this succession of steps in the treatment of a subject will now be given.

(1) Statement of the Aim.

We will examine and study the *oak trees* found in our forests.

1. (Preparation.) Let the class recall what they have seen of oak trees in the woods, size of trees, acorns. Do they remember the shape and size of the leaves? What is the appearance of the wood and what is it used for?

(The purpose of the teacher here is not to present any new facts to the class, but simply to find out what they remember from previous observation and to excite interest.)

2. (Presentation of facts.) The best plan is to visit the woods or an oak grove, notice carefully the trunk and bark, branches and leaves, acorns (food of squirrels.) On returning to school, have an accurate description of the oak tree from the class, according to definite points (*e. g.*, trunk and bark, branches, leaves, and acorns.) Then follows a discussion of oak wood for chairs, desks, doors and windows, bridges, walks, etc. (The teacher adds such facts as the children cannot furnish.)

3. (Comparison.) Name the different kinds of oak—white oak, red oak, burr oak. Notice the differences in leaves and acorns, size of trees, wood and uses.

4. (Classification, generalization.) Definition of the oak family. The oak is a native hard-wood tree. It has acorns, and simple leaves of nearly uniform shape. The wood is tough and strong, of varying colors, but always useful for furniture, building or other purposes. (After the previous observation and discussion, the pupils will be able to give a definition similar to this, assisted by a few questions from the teacher.)

5. (Application.) Children should be trained to recognize the different kinds of oak trees about home, and

to distinguish them from other hard-wood trees. They may also notice the oak panels and furniture, and be able to tell oak finishing in public and private houses.

NOTE—If there is time enough for a separate study of two or more varieties of oak, and the trees are close by so as to be seen, it is well to treat each variety according to the first and second steps, and in the third compare as above.

(2) *The Cotton-gin.*

(Aim.) We will find out how a machine was invented to remove the seed from cotton.

1. (Preparation.) Question the class on the cotton-plant, raising and picking cotton, and the uses of cotton.

2. (Presentation.) Tell or read the story of Whitney and the invention of the cotton-gin. Notice the effect of this invention on the production of cotton in the South, and upon the growth of the South.

3. (Comparison.) Name other important inventions and their effects—sewing-machine, printing-press, steam-engine, reaper, steam-boat, telegraph, etc. Which of these had the most important results?

4. (Generalization or abstraction.) Call upon the children to state the general purpose of all these inventions, to save labor, to make a better use of the forces of nature.

5. (Application.) Do any hardships result to anybody in consequence of these useful inventions? (*e. g.*, men thrown out of employment by use of machinery.)

(3) *Nouns.*

Suppose that a class has had oral and written language work, but no technical grammar.

(Aim.) In talking and writing you have been accustomed to use words. We propose to talk now about a class of words called *nouns*.

1. (Preparation.) Have you heard the word *nouns* before? Give some words that you think are nouns. Try

to point out the nouns in this sentence. "The ship sailed over the ocean."

(It may be that these questions cannot be answered by the children for lack of knowledge. But even if they show no knowledge of the subject, these questions may incite curiosity and awaken interest, and they require very little time.)

2. (Presentation.) I will give you some words that are called nouns. Stove, cherry, hat, court-house, carpet, picture, whale, shoe, barn, mountain. Have you seen all these things?

3. (Comparison.) Notice these things and see if you can tell what they all refer to. We will take two or three words that are not nouns and see what they refer to. *Up, and, quickly*. What is the difference between these words and the nouns? Look at the nouns again and tell what they refer to.

4. (Definition.) Looking at our list of nouns again you may tell what a noun is. So far as these words are concerned every noun is the name of what? (The conclusion that the children may reach by a little questioning is that all these nouns are the names of objects.) The treatment of proper nouns and abstract nouns may be according to a similar method in the following lessons, and then the complete definition of a noun can be obtained?

5. (Application.) Each child may make a list of nouns that we have not had.

Let easy sentences be given in which they may point out the nouns.

CRITICISMS.

Anticipating Results.—One objection raised to the clear statement of the aim of a lesson at the start is

that in such a statement we tell the children what we wish them to find out for themselves, that we anticipate results which they should learn to discover and state. This criticism is just if true. But it is a misconception of the proposed manner of stating the aim. It is a fundamental principle that the statement of the aim should not *anticipate* results. It should be definite and clear, but it should state a problem for solution. It should point in the direction of the result without giving the clue. If the teacher proposes to develop and illustrate the law of multiple proportions in physics, he would not state the *law* as the aim, but put it in such form as this: We have noticed that certain chemical elements unite to form compounds; we will next investigate the question as to whether they unite according to any definite law. Experiment and investigation will reveal what the law is.

Pupil's Work.—Another serious criticism of this plan of class-work is that it outlines well the work of the *teacher*, but what does the *pupil* have to do?

We will attempt to illustrate as follows:

(Preparation.) The pupil has to prepare his lesson before coming to the class. This is done in all good schools. Suppose that the subject treated is the early discovery and exploration of the Ohio Valley previous to the French and Indian War. The teacher proposes this as the next topic for history study. If this subject is treated according to the recitation plan, the first thing is to determine how much or how little the children know of the proposed subject. Who were the first explorers of the Ohio Valley? Whence they came? Who owned the land? The topics naturally brought out by this brief questioning are, The French, the English, the Indians. Having determined thus what the children know, and

having excited their curiosity, the next work for the teacher (at this stage) is to indicate what pages of the text-book and, if desirable, what pages in other histories bear directly upon this topic. If the references are more than one person will have time to look up, certain persons or sections of the class may be asked to be prepared on special points or books of reference. The work of preparing the lesson by studying up these references is similar to that of lessons as usually assigned.

(Presentation.) Now the pupil is required not only to present the topic which he has studied, but to pay close heed to the additional facts and topics presented by other pupils, and to see if he can arrange the facts presented by the whole class into systematic form. The proof of this ability is the oral statement of the main points. It is plain that the pupil must have his wits about him, pay close attention to all that is said, and then exercise his own powers of arrangement and expression.

With the completion of this part of the work we should be done with the first two steps, namely, the *preparation* and presentation of the facts.

The third step consists of a *comparison* of the facts of this lesson with similar facts or topics in other lessons previously learned. The self-activity of pupils is fully awakened by asking them to reproduce similar cases in American history where the English and French, the English and Dutch, the English and Spanish have both explored and laid claim to new territory, causing conflicting claims; *e. g.*, the claim of the English and French to Nova Scotia; the claim of English and Dutch to New York; the claim of English and Spanish to Georgia and Carolina; etc.

The clear statement of each of these cases and their comparison will bring out a common conclusion from the children regarding them all (fourth step). What did all these claims rest upon, and how were they enforced? The pupil's own intelligence and moral judgment are abundantly sufficient to answer these questions. The conclusion thus reached will probably point to the manner in which the claim to the Ohio Valley was settled (fifth step).

After a topic has been thus fully treated before and during the recitation, it will often prove an excellent exercise to call for a written composition giving a full discussion of this topic. The pupil is left free to treat the main topics in his own way. The outline of the subject has been already fully developed in the class, but the pupil is free to discuss the points in his own language and to form his own conclusions.

TRANSLATION FROM PROF. W. REIN'S "DAS ERSTE
SCHULJAHR."

The Formal Steps in their Outlines.—Proceeding now to the act of instruction itself, we notice first of all that the subject-matter of every study like Arithmetic or Geography is to be divided up into a large number of smaller parts, units of instruction, each of which will occupy from one to four, or even more, recitations. These divisions of a term's work in History or Geography are what Ziller calls *methodical unities*, and each one of them is to be carried through the successive steps of a systematic recitation plan, namely, the formal steps.

For if the single topics which go to make up the great variety of school studies are to be clearly understood and thoroughly assimilated, each must be worked over by itself. For this purpose sufficient time must be given so

that the details of each object can be absorbed, and this absorption with the details must be succeeded by a period of recollection, a brief survey of the situation, a glance backwards and forwards, so as to fix the relations of this object to others. Suppose that the instruction in a class begins with one of these methodical unities. The first thing to do is to make plain to the pupils the great *object* or *aim* of the lesson. In a primary class, for instance, the aim may be so expressed: "To-day we will hear the story of a little girl that lost both father and mother." For a more advanced class as follows: "We are acquainted with the earth as a great ball hanging in space. We will next see whether this ball is at rest or in motion."

Reasons for Stating the Aim at First.—There are several important reasons in favor of the plain statement of the purpose of a recitation at the beginning. 1. It pushes aside and out of view those irrelevant thoughts which chance to occupy the mind before the recitation, and it accordingly makes room for those ideas which are about to be developed. 2. It transplants the children into the new circle of ideas which are to demand their attention, and it encourages the rise in the child's mind of those older and kindred thoughts which will be most welcome supports to the new ideas about to be presented. 3. It excites expectation, and this is the most favorable disposition of mind for the beginning of instruction. 4. It gives the child a strong incentive to an exercise of the will, and impels it to voluntary co-operation in solving the difficulties of the proposed lesson.

The last point is of fundamental importance, and worthy of a special consideration. The pupil should know beforehand what is coming if he is to bring all his powers to bear on the work of learning, and it is easier

to call out all his effort if he knows beforehand what is to be gained. To conduct a child along an unknown road toward an unknown object, by means of questions and hints, the object of which he does not see, to lead him on imperceptibly to an unknown goal, has the disadvantage that it develops neither a spontaneous mental activity nor a clear insight into the subject.

Having reached the end of such a line of thought, the pupil looks about himself bewildered. He cannot survey the road that he has just gone over. He does not comprehend what has happened to him. He stands at the goal, but does not see the relation in which the result stands to the labor performed. He does not rise to that satisfactory mental activity and favorable disposition of mind which are stimulated by the pursuit of a clearly set purpose. No aim, no will! Now since an instruction that aims at moral character finds its highest purpose in the development of will power, it follows that a lesson should develop the will just as much as the understanding. But to develop will-power, instruction must pursue plainly set aims, and to reach them the pupil must be called upon to throw all his mental powers into the *effort*.

The general purpose of a lesson having been made plain, the real work of teaching then begins, and in every methodical unity this work runs through a succession of five steps.

First Step.—The first step in this process consists in a preparation of the ground for the reception of the new lesson. This is done by freshening up and calling clearly to the mind such older ideas as bear upon the new, such as by their similarity explain and assist the understanding of the new. It is only when a troop of old familiar ideas come forth to meet the strangers that they are received

easily into the mind. It is in this way alone that they can make a lasting impression upon the thoughts and feelings. If these forces which lie asleep in the background of one's thoughts are not called into activity, one will remain dull and indifferent to the recitation, and the instruction reminds us of a learned discourse which shoots over the heads of the listeners. Instead of interested attention and participation, it produces only weariness of mind.

This result will always follow when that which is said awakens no chords of sympathy in the minds of the hearers. If nothing springs forth from within to greet that coming from without, the lesson will be meaningless and the pupil unreceptive. Things new and strange can only be appropriated by means of a wealth of old ideas, and the plan of recitation must see to the preparation of these old materials during the first step.

Second Step.—The second step begins with the presentation of the new lesson, which will vary in manner according to the age of pupils and the nature of the study. A story would be related to a primary class, or developed according to the conversational method. A reading lesson for older pupils would be read. A geography topic would be presented by the teacher while talking and drawing, and a subject in physics while experimenting and speaking. If the preparation has been of the right kind the lesson will be appropriated with ease and certainty, and the teacher will not be compelled to talk and ask and explain all around the subject. Whenever this is necessary the preparation, *the first step*, must be regarded as a failure. What has been learned is not only to be momentarily understood, but permanently appropriated. It is necessary to close up this step with repe-

tition and drill, and these must be continued under varying forms till the lesson has been firmly fixed. In this manner the first great act in the process of teaching and learning has been completed, namely, the presentation and reception of the subject-matter, and it consists, as we have seen, of two steps, preparation of the ground and presentation of the lesson. The second act within the limits of a methodical unity is the process of building up and bringing into distinct form the general or abstract ideas which are to be drawn from the concrete materials already collected, and this second act is brought to a conclusion in the three following steps.

Third Step.—In the third step we are to bring together in the mind the newly won ideas, to compare them among themselves and with older ideas, and when necessary with additional new ones still to be presented; in short, to compare and to combine the new and the old. Such a comparison and union of ideas is necessary for two reasons: (1) in order that connection and harmony be established in one's range of ideas, and (2) that what is general and essential in the midst of special individual things may be extracted from them. Nowhere should heterogeneous heaps of knowledge, like piles of gravel, be brought together. Always and everywhere there should be an effort towards well associated and systematized knowledge. "Our whole personality rests in the end upon the unity of consciousness, and this is disturbed and injured when the mind is driven through a confused conglomerate of knowledge in which unconnected ideas are piled up together."

But every concrete individual thing which is treated as a *methodical unity* contains or embodies a general truth, an abstract notion, which may be separated from

the concrete thing in which it is embodied. But it can only be brought to light by bringing this object into comparison with other well-known concrete objects which contain the same essential idea or truth, by bringing together in the mind things similar but not identical. That which is common and essential to all is strengthened by repetition, while accidental features and differences drop easily into the background. The common truth which all the objects embody springs forth as a new idea of higher potency, as a general notion, as a rule or law.

Fourth Step.—But the abstract idea is still bound up with the concrete thing; a complete separation of this abstract or general notion from its clothing in particulars has not yet taken place: and this is the purpose of the fourth step. By means of a few well-directed questions we call out into pure and simple relief the general truth or rule, freed from its particular applications. We reduce this idea to definite language expression, and finally bring it into systematic connection with our previously acquired knowledge. It only remains to impress the abstract ideas thus acquired upon the mind by repetition, so as to convert them into a real mental possession. With this the process of abstraction is complete, but teaching cannot afford to end the matter here. A fifth step is needed to convert the knowledge acquired into use.

Fifth Step.—Knowledge and ability to know have of themselves no value either for the individual or for society. Knowledge must first step into the service of life. One must know how to apply his knowledge. Knowledge and power must be changed into use; they must be transformed into conscious ability. But will not this take care of itself? Not at all. Hundreds of children have learned how to estimate the surface of a triangle, and

many of them can give the proof of the rule with ease and precision. But put the question to one of them: How many acres does a triangular garden with sides of a given length contain? He will stand helpless, unconscious of the fact that he possesses in his own mind the necessary elements for the solution of the problem. How is this explained? He has not learned to employ his knowledge. It is a dead possession. And are there not plenty of such cases? The conclusion is that even the application, the use of knowledge, has to be learned. "Here also it is only practice that makes the master. But drill which aims only at mechanical habit is not sufficient. Even during school life that which is learned should be applied as often and in as many cases as the narrow limits of the child's life permits."

Since the value of knowledge culminates in use, instruction should cultivate its use so far as possible in a closing step called *application*. For this purpose the child should be held to a diligent use of its stock of ideas as rapidly as they are acquired, to go from the particular to the general, and back again from the general to the particular, to traverse his circle of ideas from a given standpoint in all directions, and to make use of the results reached for the solution of moral, theoretical and practical questions. In this manner a child's acquired ideas may be so developed, so welded together in firm, systematic, comprehensive association, that all his knowledge becomes a reliable, personal possession. It is clear and systematic as well as practical.

And this ends the development of general notions within the limits of the formal steps of instruction.

To recapitulate: In the work of instruction each methodical unity should be carried through the following steps:

1. It should introduce the new lesson by means of a preparatory discussion.
2. Present the new lesson.
3. Compare the new in its parts and with older ideas and their combination.
4. Draw out the general results of this comparison, and arrange them in systematic form.
5. Convert the knowledge acquired into use.

TRANSLATION FROM WIGET.

The following pages are a translation from Wiget's "Die formalen Stufen des Unterrichts," with occasional paragraphs from the author. They cover the same ground as the preceding discussion.

It is necessary to distinguish clearly between a particular and a general notion. (Between a *percept* and a *concept*.) For example, we desire to distinguish between the particular notion of a *tree* and the general notion of a *tree*. There is here a difference to be noted in the usage of language. We say the particular notion of a *tree*, as there are many, very many particular notions of trees. But we do not say the general notion (concept) of a *tree*, but the general notion *tree*, as there is only one such general notion. The particular notion (percept) is the mental picture of a definite tree and one may possess as many particular notions as one has seen trees. The general notion bears the essential nature of all trees. While the particular notion always relates to a single object, the "extension" of the general notion is much greater; it includes the family or genus.

Evidently, however, the particular notion of the *linden* in front of my house has a much richer *content* than the general notion *tree*. While in the definition of the

latter I introduce only those characteristics which are found in every tree; in describing the former, besides these, I notice a series of characteristics which are peculiar to this tree alone. While the general notion exceeds the particular notion in *extent*, in respect to *content* the opposite is true.

Between the particular notion of a tree and the general notion tree, there is a series of intermediate steps. If I think the general notions, crab-apple, apple tree, fruit-tree, foliage-tree, tree, the extent increases from one general notion to another, while the number of characteristics decreases in the same proportion, until the general notion tree in its widest extent includes all trees, but in regard to content it shrivels up to the bare characteristics of root, stem, and top.

In what relation now do the particular and general notion stand to the things of reality? The particular notion of the linden-tree in the yard is a mental picture of it (though not a photograph in the real sense of the word). A definite object in the outer world corresponds to this, if it is correct. If it is not a faithful picture, it must be corrected through the activity of the senses, till the object and the particular notion correspond. How is it with the general notion? Is there any such a thing in nature, which is simply *tree*, not a foliage tree, not evergreen, not apple, nor pear tree, neither larger nor smaller, neither slender nor gnarled? In nature there are only individuals; nothing can represent the pure general notion; each thing contains besides the general characteristics specific marks. An important conclusion is drawn from this. A particular notion (percept) is a product of *sense perception*, the general notion (concept), since it cannot spring directly from the senses, is a pro-

duct of *thinking*. It is a thought process, which, in the throng of particular notions, separates the general from particular and combines the abstracted characteristics to a general notion. The more we extend a general notion and the more we strip it of content, by so much more do we rise from the concrete reality, which is mirrored in the particular, into the sphere of the abstract, whose expression is *general notion* (concept).

The word *observation* (*Anschauung*), that is, the gaining of *particular notions* through the senses, has acquired in pedagogical language a wider significance which we must first determine. It means more than perception through sight, for we use it in reference also to perception through the other senses. But it is not covered by the term *sense perception*. Our reading books speak also of *narrative-observation-lessons*. The sense perception in this case can only refer to the letters seen and the sounds heard. But these are not the perceptions that the narrative-observation-lessons seek to develop. They refer rather to the *content* of what has been heard or read. The pupil is to get *particular notions* of the hero of the narrative, of his deeds and character. In this sense Pestalozzi speaks of observations of the feelings and mental states (intuitions), and even Comenius speaks of observations with the mental eye.

But these observations (particular notions) of a mental kind, refer just as sense perception to something *concrete*. They are not something abstract like the general notion. There is a great difference between repeating the verse, "Behold how good and how pleasant it is for brethren to dwell together in unity" and narrating some particular act of peace-making character, between saying, "neighborly kindness is admirable" and telling of the self-sacri-

ficing death of William Tell or of Howard, between describing in general terms the age of chub-law and of robber-knights and painting the life of such an adventurer with his individual traits.

Mental observation of particular deeds stands therefore in the same contrast to abstract general notions (concepts) as sense perception does.

Whether I examine a plant with the eye, receive a melody through the ear, examine a mineral through taste, smell and touch, or even through the mediation of the written or spoken word—if I represent to my mind the activity of a great man, the death of a hero, the value or worthlessness of an act or disposition; in all these cases, I have to do with something concrete, with a single picture, a *particular notion*.

It is a usage of speech to represent the progress from the narrower to the more general notions under the sense picture of rising or climbing upwards. It represents the general notion as the superior and the corresponding narrower notion as the subordinate.

We sometimes speak of the notions as built up into a structure, as a sort of pyramidal tower, whose broad foundation consists of the great variety of particular notions (percepts) the first story somewhat narrower, is formed of the lowest class notions as crab-tree, bell-flower, etc., over these rise the broader general classes, apple-tree, peach-tree, pine, birch, and above these the more general classes still, as stone-fruit, winged-fruit, etc., until the structure terminates in the highest general notion (concept) tree.

Thus objects are classed under the *general notion*, (concept) examples under the *rule*, and phenomena under the *law*. General notion, rule, law—together they con-

stitute a principle of comprehension and orderly arrangement. They give a birds-eye-view of the multitude of things known. They facilitate a correct estimate and grasp of single things. One knows "where to put a thing."

In the process of learning at what point shall our study begin, with particular or with general notions? In guiding children on the road to knowledge, shall we ask them at first to fix their attention on particular objects and persons in action or shall we have them begin with definitions, rules and laws?

Wiget says further, "The naive empirical method in pedagogy imagined the matter to be very simple. The general notions which a child is to acquaint himself with are presented to him, the system to be acquired is transmitted, cut and dried."

The botanist began with the most general notion of his science, the concept *plant*, proceeded then to the next subordinate groups, phanerogams and cryptogams, and further to the definitions of the classes, subclasses, families, and lastly to a description of the concrete plants. The geometer began with the definition of the most general notions, point, line, surface, solid and advanced to the real surfaces and solids. The music teacher started out with a drill upon the scale and followed with real songs, the teacher of literature described the character of a literary period in esthetical and philosophical review, without the students having read any of the literary products.

To-day this *systematic procedure* is generally regarded, theoretically at least, as belonging to the dead past. Its criticism therefore may be brief.

What does a pupil think in connexion with a dictated general notion or one learned from a book? "A *triangle* is a surface bounded by three straight lines." "To the *pulse family* belong woody or herbaceous plants with simple, triple, or pinnate leaves, with mostly irregular flowers." "In accented syllables a single consonant following a single vowel, etc., is doubled." They are for him simple words. "Particular notions without general notions are blind" says Kant, and he added, "general notions without particulars are empty." But let it be supposed, that the pupil is able to represent something to his mind from these definitions, how shall he become conscious of the fact that the rule or definition learned is really a *comprehensive idea*, a clasping together in one thought of the common characteristics of a class of individuals, unless he has first tested it in a series of triangles, plants of the pulse family, etc.? It is therefore an illusion to suppose that a general notion, for which particular ideas are wanting, can be directly transferred to a pupil. People have long known this or at least felt it, and have subjoined a few illustrations to the rule. After seeing the examples the child understood the rule. But if the child only understands the rule after the illustrations, why put the rule first? Ratich long ago called this a round-about way. Rule—example—rule. We can save ourselves the trouble of setting up the rule at the beginning of the investigation.

The example, the particular notion, must be the starting-point of knowledge. "Nothing is in the understanding which was not first in the senses." (Comenius.) This is the course which the earliest men were compelled to enter upon in appropriating general notions. Text-books, outlines and tables did not grow on the trees, nothing

was given but the concrete things and phenomena. Concept and rule were the work of the mind.

In contrast to a *logical* and *systematic* procedure, which advances from the general to the particular, it is a *psychological* process. It can be seen that a full description of this process must fall under the chief heads, the acquisition of particular notions and the derivation of general notions.

HOW ARE INDIVIDUAL NOTIONS GAINED?

By individual notion we understand a concrete single picture. Such a single picture is not a *simple idea* but under a close scrutiny it turns out to be something *complex*. The individual notion of a piece of chalk consists of a series of elements, of the idea of bulk, of color, of hardness, of structure, of taste. The individual notion of a plant, of an animal, of a continent, consists of a multitude of elementary ideas. So it is also with individual historical notions, with the life-picture of Charlemagne, with the idea of the Burgundian wars, or of a single battle in them, with the mercy of the Good Samaritan, and so with the esthetic ideas of a song, a picture or statue. The individual notion designates something concrete, something particular, but it is always a *complex thing*.

How do we attain to individual notions? We shall catch a hint by testing our newly acquired ideas as to their clearness and definiteness. While upon an excursion we observe a plant, and afterwards desire to describe it to a botanist to ascertain its name. "How many petals had the corolla? Were the stamens attached to the petals?" We are unable to answer, and yet we saw the parts named; they stood before our eyes; but these features are lacking in our mental picture. If a number of

plants were laid before us, including the one mentioned, we should perhaps recognize it. "It is this one, not that." We are able to distinguish it from others, but not to fully characterize it from memory, "I entered the woods in a dreamy whim, in search of naught, such was my aim." The hasty sketch was due to lack of purpose; a purposed attention would have produced a better result. A better result? Certainly. But would it have been complete? We examine many a plant, machine, building, relief, carefully and attentively, and we are still unable to give exact account to ourselves or to others of the thing seen. The perfect picture does not follow the first attempt. So is it also with other ideas. We have listened eagerly to a melody and then hum and whistle it, but one strain is forgotten and no thinking can supply the defect. We have read the history of the seven year's war and a moment later are not able to reproduce the battles in exact order. In the life of Charlemagne we fail in an exact idea of the succession of the Saxon wars, and if only a name or a date is lacking the notion is not complete.

The first impression is as a rule somewhat incomplete. But the outline may be completed. Each one does it more or less consciously in the same way. One takes up the plant, the book, or the picture the second time, he has the melody sung again or glances at the notes and directs the whole attention to the defective parts. If a single return to the object is not sufficient a second follows till the result is satisfactory. After grasping the rough outline of the whole we drop into absorption with the details. The individual notion thus ripens. Sometimes it takes place involuntarily by accidental repetition of the impression, sometimes through effort and perseverance, frequently in a few hours, often after years.

But the speed of movement makes no difference in the articulation of the process. *Outline view of the whole—absorption in details—recollection of the whole.* These are the steps.

How should individual notions be produced in children? Should we attempt to avoid the defective, rude outline of the whole? Or shall we imitate the natural course and through imitation assist and accelerate it? Comenius prefers the latter. He asks that the eye of the pupil first take in the whole object, then master the single parts and tarry long enough with each till it may be clearly grasped. (*Magna didactica*, Chap. 20.) And Pestalozzi is of the same opinion. Since this method of procedure is based upon a psychical process the term *natural* may be applied to it in a genuine sense of the word. Let us take a concrete case. In natural science lessons the potato is to be treated. The pupil already knows much of its use as food for man and beast, for instance, the time of planting and digging, and the appearance of the vegetable. But he has probably only a faulty notion of the plant; some essential marks of the flower and fruit are not yet familiar to him, at least not perfectly clear. What has the teacher to do if he wishes to enter upon the psychological process before indicated? He must begin with a rough outline view of the whole. He must first determine what the pupil knows. He must lead him to express himself concerning it. It is also advisable to bring into definite order whatever the pupil communicates, that touches on the nature of the subject.

Now comes the second part of the work—the *absorption* in the details. The bulbs were designated by the pupils as the fruit of the plant, the notions of the flower were indistinct. Specimens are distributed. "Now

look at the flowers again." Thus the single parts are examined so far as they are important, and afterwards the whole outline is completed. Grasp of the whole—absorption—review of the whole.

In applying our principle to the above example will the omitted characteristics in the picture of the potato plant be grasped distinctly, if in accordance with a *systematic* description, they are mingled interchangeably with what is well known—first something known, then something not before noticed, and again a familiar part being described—or is it better, after reviewing the familiar points sufficiently, to drop them for a while into the background of thought and direct one's attention to the lacking part, fix this firmly and associate it with the whole?

The second plan is the better both for the sake of attention and of thoroughly impressing it. In fact we shall not seek to cover up nor to render indistinct the transition from old to new, but on the contrary make it very distinct. The supplementary facts and explanations are first fixed by themselves. "Who can tell me again what we have just learned?" Thus each point is brought into proper relation to the old. "Now we will repeat the whole again but not forget to add also what we have just learned." Thus the individual notion is developed.

When a child is first summoned to give as full an account as possible of an object from his own experience and when new information is afterwards brought in to supplement this, it is manifest that the self activity of the pupil and his interest are aroused.

The imitation of the natural progress from the crude grasp of the whole to absorption in particulars recommends itself to us then for three reasons. 1. It insures

both to the old and the new the right quality and vigor of attention. 2. It favors the self activity of the pupils. 3. On the basis of apperception, it reviews and vivifies the old ideas so that they will be of more service in acquiring the new. "For related old ideas condition the reception of the new. From this law is derived first of all, a direction for the selection of the subject matter. *It should never be absolutely new.* It should always be so selected and arranged that it may find related facts in the child's knowledge."

In reading lessons a useful preparation (first step) may sometimes consist in suggesting a similar line of thought to that in the lesson, before the pupils read the lesson itself. Southey's "Battle of Blenheim" may be prepared for by calling up the scenes of a battlefield and by naming the relics that are found in such a place. By reproducing from memory what the children may have heard or read of such scenes, the appreciation of the selection will be more rapid and vivid. To insert the references and explanations from time to time during the first reading of the piece tends to interrupt the strength and unity of the impression. "The sphere of action belonging to *preparation* is thus widened. Not simply one but a whole complex of ideas is called to mind and brushed up in order to insure a reception of the new into a kindred family group." (Wiget.)

Frequently a double sort of *preparation* is serviceable. When studying the *camel*, it is fitting to call up not only what the pupils may know of the camel, its use and manner of life, but also the characteristics of similar animals more familiar to the children, as of the ox and sheep. Or if the battle of *Yorktown* is the new subject, not only review what may be known of it but of other similar con-

licts during the Revolution, as Bunker Hill and the Evacuation of Boston, or Lincoln's surrender at Charlestown.

There is, to be sure, perpetual danger of overshooting the mark by allowing too wide a range of recollection, danger of calling to mind many irrelevant things and of wasting time and losing sight of the main topic. But if the teacher has an objective point clearly in view, he can direct the discussion and hold it to its proper limits. Some methodical unities are so complex and extensive that we are called upon to alternate two or three times between preparation and presentation. A reading lesson should usually be divided into two distinct parts, each of which should pass through the steps of preparation and presentation. First the study of the subject matter, the *meaning* of the piece; second, the work for attaining *proficiency* in reading.

Longfellow's "Village Blacksmith" recalls familiar scenes to every child. After touching upon these the piece may be read with sufficient questioning to bring out clearly the meaning of each word, simile, and verse and the thought as a whole. Thus the first preparation and presentation are complete. Proficiency in clear and expressive reading is the next aim.

The preparation may begin with a phonic drill upon some of the more difficult words as *chestnut*, *bellows*, *choir*, *paradise*. In advancing from verse to verse emphasis must be laid upon clearness and expression until the difficulties of the piece are brought into a clear light. The final drill, which aims at perfection in the *art* of reading, is a step beyond presentation and belongs (if indeed at all in the formal steps) to application.

FROM PARTICULAR TO GENERAL NOTIONS.

The general notion is the higher form of knowledge into which the particular notions are to be transformed. In the nature of general notions lies a suggestion of their origin. He who has seen but one rose, one triangle, can have *no general notion* of rose or triangle. He who knows but one case of a plural ending in *s*, but one illustration of a feminine in *a*, can have no knowledge of the rule, or if he knows but one example of the power of attraction he is not conscious of the *law*. General notions, rules and laws can only be derived from a number of examples, from particular cases. Since they are the expression of what is general and universally accepted, it is a matter of primary importance, by comparing the multitude of related facts and phenomena, to separate the general from the individual. This process of abstraction is not always executed under the direction of the will, but frequently, as in the correction and amplification of our particular notions, without purpose and by accident. We must therefore call in question the above mentioned statement, that general notions are a product of *thinking*, so far as thinking is looked upon as a voluntary act. For even a child, before all instruction and without voluntary reflection, appropriates a great variety of general notions, or what corresponds to these. When he sees the big dog or the little poodle, the slender grey-hound or the short-legged spaniel, he cries out "See the dog." He therefore proved that the class *dog* is familiar to him and that he knows how to fix each in its class.

The *psychical* process which mechanically produced this general notion, may be plainly seen. With every new dog seen the characteristic idea of dogs repeated itself; when he had seen ten the perception of the com-

mon feature had repeated itself ten times while the peculiarity of each dog had appeared but once. In looking at an equilateral, an isosceles, and an irregular triangle, the idea of three-sidedness was repeated each time, while the facts of the equilateral, isosceles, or irregular form appeared but once each. It is therefore easy to see that the repeated perception of that which distinguishes a triangle or a dog impressed itself in a deeper and livelier manner than the particular features and that gradually one forms the habit of overlooking the particular features or of seeing them only hastily and imperfectly.

This ascendancy of the general over the particular manifests itself unmistakably in the fact that we designate all the different varieties by the word *dog*, or in the other case by the word *triangle*.

Before school days begin a child attains the general notions, man, wife, child, person, horse, bird, fish, worm, animal, rose, flower, leaf, root, tree, grass, plant, and many others. But when we begin to scrutinize the general notions that spring up in accordance with the natural psychical mechanism of the mind, we discover, as in testing the accidentally acquired particular notions, that the *psychical general notions* are, as a rule—defective, crude; if one is not so it is accidental, since the psychical concept is always a work of chance.

Some of them do not contain all the general characteristics.

A child is not able to define the general notion dog as zoology requires it. Besides the general form, he thinks perhaps only of the barking and fighting, and would not hesitate to call a wolf a dog on meeting it the first time. The fish is that which swims, the bird is that which flies,

and accordingly he classifies the whale under the former and the bat, fluttering in the twilight, under the latter.

Or the general notion is given characteristics that do not belong to it.

With the general notion fruit we easily combine the idea of use as a food product. Then comes the false idea of the potato bulb. Grass is at first defined as that which grows in pastures as food for cattle. In both cases there attaches to the psychical general notion another defect. The general is too much blended with the individual. Instead of thinking of the characteristics, we think of the individuals to which they belong. This is natural, for in the above-mentioned process of forming general notions by accident, some characteristics, to be sure, have become more clear through repetition, but a conscious detachment from others less distinct has never taken place.

Therefore the psychical general notions, if designed to furnish a reliable knowledge, must be revised and corrected. In testing each single characteristic we ask, "Is it also peculiar to all the individuals to which the other common marks apply?" and, "Are all the marks included which belong to the characteristic of the whole?" Content and extent of the general notion are examined and, according to the test, expressly *altered* or accepted. The general notion dog is clearly defined; from the notion fruit the idea of use for food is excluded; to the general notion fish the particular kind of breathing and reproduction is added; the notion grass is extended to include the botanical grasses.

During the process we come to the detachment, the abstraction of the general notion. In raising the question, what characteristics belong to the dog, to the tri-

angle, to the notion fish or plant, the class features are isolated. The systematic effort to combine the common features leads to the detachment of the general from the particular. But this is successful only to a limited extent. We are unable to think a pure general notion, for example the concept triangle, without imagining an equilateral, isosceles or irregular one, or a right, acute or obtuse triangle, represented by marks on paper or with crayon on the blackboard. The concrete features always intrude themselves. But we are able to perceive our psychical incapacity and to say, "all these particular forms are triangles, but none of them belongs to the general notion. I ought to be able to think three-sidedness without these particularities."

The verification of the psychical general notion according to extent and content, the detachment of the general notion from the individual, all this is in truth no longer the work of an unconscious psychical process, it is an effort and oftentimes a severe effort, requiring purpose and endurance.

And now we return to the proposition whose truth was put in question and give it more exact wording. The verified *logical* general notions are the *products of thinking*.

But the road along which *thinking* produces logical general notions, when closely surveyed, is not essentially different from that which leads to psychical concepts. The psychical general notion presupposes a number of similar particular notions, and so also the logical concept—but while the psychical mechanism works up the accidentally collected particular ideas, without criticism, to a general notion, *thinking* first inquires whether the individual notions present to the mind all belong to the

general notions and whether all the appropriate individual notions are at hand (thinking sifts the extent of the general notion).

By repeating the idea, the psychical mechanism strengthens the general characteristics; thinking does the same, but it lifts them through conscious and voluntary comparisons into notice and isolates them from the concrete, while it collects them together by themselves. (It defines the content of the general notion.) The work of thinking is similar in kind to that of the psychical mechanism, but it is more thorough.

APPLICATION TO METHOD.

To teach a pupil to construct general notions is identical with teaching him to think. But is he capable of thinking logical concepts, seeing that his teacher is unable to do it? We relinquish the claim at once. In elementary teaching the general notions will fall far behind the requirements of logic in more than one respect. Frequently it will be impossible to exhaust the extent that is, to bring together all the particular notions that belong to the concept. Then, of course, the content also can not be exact. So long as nothing has been said of the whale the pupil will assign to the general notion *mammal* the attribute of possessing four legs. Secondly, the child is much less able than the grown person to think a general notion abstractly. His imagination constantly rests upon concrete typical objects.

But within the limits of those observations that are accessible to a child, instruction may follow the course of *logical thinking* and, thereby strengthen and hasten the mechanical process to which the child would otherwise remain subject. It will lead the pupil on to compare kindred things with purpose and attention, and to expressly collect the general characteristics.

Comparison—*gathering together the attributes of the general notion.* This is the articulation of the process of abstraction in teaching. Perhaps it would be fitting to begin teaching by verifying and remodeling the numerous loose concepts which a child brings with him to school, and after this range of experience has been logically reconstructed, to enrich his mind with new observations (particular notions). But it is evident that this labor could not be accomplished in most cases without a return to the individual notions, because the single pictures, from which the general notion should have been drawn, are defective (as noticed above). But even if the quality of the individual notions permitted us to devote a longer time to their systematic arrangement, it would still not be permissible for another reason. The general notion offers no new material, its elements are all familiar, they are only to be differently grouped. But all instruction that furnishes no new facts will very soon dull the interest and the desire to learn. Both considerations, therefore, are favorable to an alternation between the process of observing particulars and that of generalization. When new observations (of particulars) have been made, we see to their comparison among themselves and with kindred ideas already present and thus bring both the old and new into closer systematic order. With the new perception of a particular dog are associated the common points of agreement which the children have noticed in other dogs. There is formed a common picture, composed of the attributes, qualities and habits peculiar to all dogs, which is more complete than the psychological. Subsequent instruction joins to this the study of the fox and wolf. But it does not stop with simple observation. There follows a comparison of the fox,

wolf and dog. The outcome is reached by joining the points of similarity, namely of the canine family. If a later methodical unity treats the group, marten, pole-cat, weasel, sable, fish-otter, a comparison first gives the general notion of the marten family. By contrast it also emphasizes the two family notions—marten and canine.

But above the contrast, the comparison recognizes a higher common attribute, the general notion of the *flesh-eating* animals. The comprehension of this general notion is expressed through a definition. The flesh-eaters have certain common marks, so and so. The flesh-eaters are the martins and the canines. They differ so and so from each other. If the study of the cat family follows this, the steps of preparation and presentation (analysis and synthesis) produce the individual notions house-cat, lynx, lion, tiger. The third step compares these species with each other, the family marks with those of the martens and canines and establishes the fact that the cat family also possess the characteristics of the order *carnivora*.

The comparison of individual notions with respect to their common marks and the *grouping together* of the latter into a general notion pass imperceptibly from the one process to the other. The third step proceeds from the illustrations to the general notions (concept, rule, law). It is the course of *induction*. The *fourth* step proceeds in the opposite direction. The general idea indeed is to be detached from the individuals and so thrown into prominence, but it should not lose the concrete ground on which it stands and therefore illustrations are subjoined—it is the systematic course of a scientific text-book (*i. e.*, first rule, then examples). The fourth step restores the relation between a school science and a professional science, and receives justly the name

system. It is itself a detached part of a text-book, and where such is introduced (grammar, catechism, history-table or outline) it is fitting to refer to that portion of a scientific text-book which elaborates this topic, underline it, and supplement it by the examples just learned. However insignificant this inversion may seem in a single case, still it is the necessary transition to that other mental movement of which the pupil shall be capable, according to Lessing: "to descend from the general to the particular after he has advanced from the particular to the general."

Outwardly the fourth step is distinguished by entering the results of the comparison in a note book, so far especially as one deems it important not to encourage forgetfulness, but desires to secure reliable supports for repetition.

The process of observation and abstraction (first grasp of the whole, absorption, comparison and system) are the steps that lead to concepts or at least to what approximates abstract knowledge. But since observations (individual notions) constitute the basis of the entire structure, since further a whole throng of particular ideas may fall under a single general notion, and every general notion be supported by at least several individual notions, it is plain that a greater amount of time must be expended upon the first two steps, which serve the purposes of observation, to correspond with their importance. When sufficient pains are taken in securing the individual notions of a dog, wolf, fox, marten, polecat, weasel, etc., the third and fourth steps will then require but little time. The family characteristics of the dog, marten, and cat may be soon grouped together and their kinship as carnivora may be established by a few

statements relative to dentition and food. The process of abstraction proceeds more easily when the way to comparison has been paved during the process of observing individual things.

If similiarity and contrast promote the apperception of the new, they are also advantageous to the third step (comparison), which repeats again the general characteristics and the sub-class variations for the purpose of systematic arrangement. Since the process of abstraction brings out nothing new, it is an advantage when we do not need to tarry long with the third and fourth steps.

The families and orders are not the only categories that botanical instruction recognizes. Root, stem, leaf, inflorescence, environment, use, are also general notions which should be wrought out from the mass of concrete materials. They furnish new points of comparison for the third step, and in the fourth step (system) we *sketch* under the heading *Root* the different forms as they appear—as *tap-root*, *fibrous*, *tuberous*, and near these sketches we write the names of the plants in which we have seen these forms illustrated.

In such manner we arrange and secure our possession. To link thoughts together means to secure them against forgetfulness. Association of ideas is the condition of memory and the connexion according to inner kinship, its best support. The comparisons of the third step have no other aim. They are associations of individuals and lower concepts according to logical and essential characteristics.

In many cases the process of *abstraction* ends with the association of individual notions and does not lead to the detachment of the general notion. Association must first collect the material for concept building. In getting at

the rule for the doubling of consonants we lay in a catalogue of words in *ll*, *nn*, *ck*, etc., by reserving a column for each series. These associations develop the language instinct, for it depends upon the psychical mechanism. When the notion is at length ripe, we pluck it; the reason for doubling the consonant is recognized, *ck* is seen to be equivalent to *k k*, etc. Now the systematic order is reversed; we need no longer notice the whole extent; one illustration is enough. The general notion relieves, unloads the mind. In the fourth step, on the page devoted to spelling, we make a new entry. *Doubling the final consonant*, example, telling, running, ticking.

Whether we arrive at the logical concept or not, (and in elementary stages the latter will often be the case) the association that leads up to it should never be lacking in teaching. Everywhere the command is *to collect* and to collect according to logical categories.

The association is not narrowed of course within the limits of a single study. For it is manifest that from the sum total of instruction the least will be lost when each study gathers up its own peculiar notions wherever they appear in the broad field of instruction.

In instruction we desire to make the power expended by teachers and pupils as fruitful as possible; for this reason we are much concerned that the ideas be bound together and the associations themselves or their results (rule, concept) be fixed in writing.

Pupils should be required to keep note-books of uniform size in which the results of the lesson should be daily entered. This need not interfere with the proper use of text-books. "We have some further remarks concerning the form of such entries. We have called them *catch-words*; they are not to give the whole matter but

only to suggest it. Consequently we did not enter the *rule* for the doubling of the consonant, but only three examples: *hitting, running, ticking*. Had we done the opposite, there would be danger that the pupils would retain the rule and forget the examples. Then it would not be a rule but an empty formula. As soon as the general truth has lost its connexion with the concrete, it is a worthless shadow. 'Concepts without individual notions are empty.' We cling therefore to concrete types, to pattern-examples; but then we must also see to it that the pattern-examples retain their reproductive power, that is, we must associate example and rule. We should require the pupil therefore while looking at the example to construct and reproduce the rule, *e. g.*, "A final consonant, preceded by a single vowel, doubles the consonant, when—etc."

In one form or another the entries of the fourth step contain the child's system of knowledge. Perhaps the significance of the proposition has now grown clearer, we are not obliged to offer a ready system, but to let one *spring up* gradually. The text-book contains the whole system, the note-book with its catch-words, the pupil's arrangement of his concrete circle of observation.

In the scientific text-book stands the complete logical concept; a psychological instruction allows it to ripen. The first entries often lift themselves but little above the loose psychical concept, they are only associations. The number of associations is, at first, limited, consequently the concept contains attributes that must later be excluded. (The idea that mammals are all quadrupeds.)

The systematic course is determined by the logical relation of general notions; it treats exhaustively the forms of leaves, simple and compound; it advances to the

inflorescence, cluster, spike, umbel, head, then follow the forms of flower, fruit, etc. It is similar to the catechetical teaching of the clergy. According to the logical succession of topics in which the subject matter is arranged in a system, it is treated from the beginning; the systematic order is already contained in the course of instruction. A *school science*, on the other hand, is distinguished from a professional science in this, that its course is determined by other considerations. It is influenced by psychological motives. It follows the zigzags and leaps of a natural interest, which pursues phenomena within the circle of experience, the seasons with their fauna and flora, their field labor and games, or the impulses of other contemporary studies. From domestic animals to the plants that serve them as food, from cud-chewing animals to milk and its products, from the cream on the surface to specific gravity. With the explorers to India and America, with the Crusaders into the Holy Land, with Charlemagne from the Weser to the Ebro, and from Lombardy to the valleys of the north. Religious teaching finds to-day examples of philanthropy and patriotism, tomorrow of peace-making, energy of will, fidelity, faith in God, and again a reason for faith in the divine order of the world.

But the associations and the entries (in the note book), bring everything to its proper place, so that finally in every study the structure stands complete, the catechism, the system of geography, of natural history, etc.; or at least it has been developed and has been so rooted in the concrete that the pupil can support the further burden of systematic arrangement for the sake of supplementing and rounding out his knowledge (catechism river system, the forms of the strong conjugation, local home history, history of literature, etc.).

The system of professional science, at least an approximation to it in respect to both quality and quantity, is the *logical aim* of teaching. A course of study, which, although it constantly follows interest, still exhausts gradually all the chief topics of the subject in a degree suitable to an elementary school, is the *psychological way* to the aim. But this road is not yet built. Its survey and construction are labors which demand the services alike of the student of method and of the scientific specialist. For the problem involves the double duty of being just to the scientific subject matter and to the psychological spirit.

To recapitulate—The logical elaboration of the subject matter is accomplished in two steps. *Association* ties together similar things for the sake of securing intellectual centres, and particularly to pave the way for the derivation of concepts. *System (generalization)* gives to the results of association their scientific (systematic) form and fixes them by corresponding entries in the note-book.

APPLICATION ; FROM KNOWLEDGE TO PRACTICAL POWER.

We do not wish for a *dead knowledge*. The meaning of this expression is clear; knowledge with which you can undertake nothing, which lies like an inorganic substance in the mind, which sets up no objective aims, and presses to no application. We desire a knowledge that produces shoots like a plant, grows from within outward, generates interests, a productive, or as it has been fittingly called, a *living* knowledge. According to its capacity to increase the mental power and self-activity of the pupil must the educative value of a method also be measured. Instruction therefore must beget a logically well-ordered and productive knowledge.

This is perhaps only a new term for an old thought; instruction should produce not simply knowledge but power. But there may be a doubt as to the identity of the two notions. If, as happens now and then, under *power* is understood skill in the arts of reading, writing, drawing and singing, and to some branches is attributed the cultivation of knowledge, to others the training of power, we cannot subscribe to it. Pestalozzi requires that knowledge and power shall stand related to each other as fountain and stream. This points then to the unity of the subject matter for knowledge and skill. If one will formulate the statement as follows, that the aim of instruction is a knowledge *in which power takes root*, Pestalozzi's idea may be correctly reproduced.

Under power we do not understand a physical or manual skill. All knowledge must be translated into power, this means nothing else than that knowledge must be changed into skill, must stand ready for service wherever and whenever it is needed. A beginner on the violin may be able to play the scale correctly, but he does not play it with smoothness and perfection. At every trial he must give painful heed to the correct position of the arm and hand and the use of the right finger and string. The ready player thinks nothing about these things. He scarcely has the purpose of striking the tone *a*, for the requisite muscular movements are performed almost involuntarily. In time he comes to the execution of a whole scale or piece of music in this manner. The means that have brought him to this we call *practice*. Practice transforms knowledge into power. Repetition makes the mental movement so fluent and sure and binds the links of the series so firmly, that they run off without check and almost unconsciously whenever an

impulse of the will sets them in motion. This is strikingly true in arithmetical operations. Drill secures to the book-keeper the same skilled routine in the complicated processes of reckoning interest, compound interest, etc. But just as these operations in the earlier steps of fixing the individual and general notions have stood with great distinctiveness before the mind, with respect to the succession of their parts and the proofs in detail, so the skilled reckoner can recall them to mind in the fifth step (skill), if required to give an account of his action. His skill rests upon insight. *Through the intelligence to skilled routine.* This is the power which the fifth step may not indeed bring to perfection but can pave the way to. Thence the universally recognized necessity of drill exercises in arithmetic and language. By combination with previous knowledge these exercises become at once *incidental* (immanent) repetitions. By these associations drill receives a new element of increased incentive to interest. Besides this, the full and facile use of what has been learned is thereby promoted. Toward a free disposition and use of knowledge, association and systematic arrangement have already contributed. But while it was there only incidentally furthered, it is the chief aim of the fifth step. Knowledge is not freely serviceable so long as it remains constrained within the series in which it was first learned. Themes must be appointed which train the pupil to release the elements of his knowledge from their old connexions and to combine them into new forms. The order in which knowledge stands must be changed.

It is natural that these exercises are easily discharged when the pupil commands only a narrow field. But in the degree to which his knowledge expands, the demands upon his original productive power are increased.

Instruction in literature in higher schools leads to the elaboration of such themes as "The wonderful in poetry," "The estimation set on friendship by our great poets," etc.

Instruction must also sharpen the pupil's power of discernment and judgment. To bring this to a test and to establish it is the function of the fifth step. For instance, a new sound has been learned in a *type word*; it is to be recognized by the pupil in a new word.

Finally we have a particular sort of application to emphasize, namely, the preparation for the pupil's *practical conduct*. He should be gradually led to apply to his individual circumstances the maxims of morality and practical wisdom which he has drawn from religious, historical and poetical materials. From examples of neighborly good-will, of generosity, of social temper and patriotism we turn to the injunction, "Go, do thou likewise."

Through the fancy the child should put himself in positions where he may exercise these maxims. In thought he should often see himself acting according to these principles. In every such case the fancy creates associations between concrete situations and the maxims applicable to them; the more firm and numerous these associations, the greater is the surety that the principles appropriated have been turned into flesh and blood, and work unconsciously. Thus there is developed, analogous to the skill in reckoning, a skill in conduct—*tact*.

To be sure the perfection of tact is only to be attained in the stream of the world, but in the quiet of the school and in the domestic circle this talent must be cultivated. The principles of conduct must be as familiar to the pupil as the four fundamental operations in arithmetic. What

was said there in favor of mathematical dexterity must be repeated here in favor of *tact*. We are able at any moment to think clearly only a limited number of ideas. But in conduct, a person, at every turn, has a multitude of things to consider. If one were compelled to think each thing clearly and definitely, he would come to a halt at every step or he would advance rashly to action and overlook this or that. Drill must perform the same function in this case as with the arithmetician; the association must see to it that ideas which have become unconscious shall still affect the determinations of the will in the form of feeling (instinct).

The same is true of pedagogical tact. Who could remain clearly conscious of methodical rules during every moment of instruction? What would be the outcome if one were compelled at every step to make sure of his scientific bearings? Yet tact cannot be taught directly, but only by indirect means. Pedagogical principles in the first place must be brought clearly before the mind; the preparation for the following lesson should keep in view all possible contingencies and bring them under the correct general notions; the teacher, just beginning, must see himself in thought working before his class. After this he proceeds to action; criticism supplements the defects that appear and strengthens the associations, and drill finally insures their effectiveness even when they remain below the line of consciousness.

However different the fields of labor may be, all the forms of rational tact have this feature in common with the skill of the arithmetician; they work unconsciously but all their elements have taken the road through consciousness and can be re-called to it at any moment.

From knowledge to *power* therefore means the same as from knowledge to *skill*, to *tact*. Since our momentary consciousness is so narrow, we must see to it that the ideas, when once excluded from it, are not entirely lost, but, as it were, stand on picket and remain accessible to every hint. But even beyond our consciousness their reflex influence upon our conduct must be perceptible. They must conduct themselves like troops, only a part of whom are drawn under fire (consciousness); but in spite of their covert position they constitute the basis of operations for their comrades.

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